Ontario

THE COMMISSION ON THE REGULATORY CONTROL OF MOBILE PCB DESTRUCTION FACILITIES

REPORT OF THE COMMISSION

JUNE 28, 1985

THE COMMISSION ON THE REGULATORY CONTROL
OF
MOBILE PCB DESTRUCTION FACILITIES

REPORT OF THE COMMISSION

M.G. Munro
Commission Chairman

R.B. Eisen, Q.C.
Commissioner

J.W. Britnell
Commissioner

June 28, 1985

S.R. Garrod, Counsel
Y.T. Fernandes, Registrar

Ontario

The Commission On The Regulatory Control
Of Mobile PCB Destruction Facilities

Commission de surveillance et de réglementation des
installations mobiles de destruction des PCB

1 St. Clair Ave. West
5th Floor
Toronto, Ontario
M4V 1K6
416/965-2531

1 ouest, avenue St. Clair
5e étage
Toronto (Ontario)
M4V 1K6
416/965-2531

June 28, 1985

The Honourable James J. Bradley
Minister of the Environment
135 St.Clair Ave. W., 15th Floor
Toronto, Ontario
M4V 1P5

Dear Mr. Minister:

On the 28th day of June, 1984, we, the undersigned, were appointed by Order in Council No. 1772/84, amended by Order in Council 519/85, to conduct an inquiry into the proposed regulatory and administrative program of the Ministry of the Environment to effectively deal with the establishment and operation of mobile PCB destruction facilities on temporary sites in Ontario.

The inquiry has been completed and the directions of the Order in Council have been fulfilled. We, therefore, submit our report on the inquiry, along with our recommendations.

Respectfully submitted,

M.G. Munro
Commission Chairman

R B Eisen

R.B. Eisen, Q.C.
Commissioner

J.W. Britnell

J.W. Britnell
Commissioner

REPORT

OF

THE COMMISSION ON THE REGULATORY CONTROL

OF

MOBILE PCB DESTRUCTION FACILITIES

TABLE OF CONTENTS

Page

1.0 INTRODUCTION 1

2.0 BACKGROUND ON PCBs IN ONTARIO 5

3.0 PRESENT LAW AND POLICY 9

4.0 THE PROPOSAL 15

5.0 KEY ISSUES 18

5.1 Jurisdiction of the Commission 18

5.2 Classes of Mobile Facility Sites 19

5.3 Health Effects and Air Quality Criteria 22

5.4 Occupational Health and Safety 33

5.5 Source Sampling and Destruction Efficiency Standard for Class 1 Facilities 37

5.6 Separation Distances 43

5.7 Exemptions from Public Hearings 51

5.8 Regulation or Administrative Practice 58

6.0 RATIONALE FOR RECOMMENDATIONS 59

6.1 General Approval 59

6.2 Application and Approval Requirements: Technology 62

6.2.1 Demonstration Testing 62

6.2.2 Application Form 63

6.2.3 Data Quality Assurance Program 63

6.2.4 Process Parameters 64

6.2.5 Dual Instrumentation 65

6.2.6 Destruction Efficiency Standard for Class 1 Facilities 67

TABLE OF CONTENTS
(Continued)

Page

6.3 Application and Approval Requirements: Sites 67

6.3.1 Class 3 Sites 67

6.3.2 Public Notification 67

6.3.3 Upper-Tier Municipalities 70

6.3.4 Separation Distances 71

6.3.5 Contingency Plan 71

6.3.6 Performance Bond 73

6.3.7 Insurance 75

6.3.8 Boundaries for Consolidation of PCB Wastes 76

6.3.9 Operator Training 78

6.4 Standards for the Operation and Maintenance of Sites 79

6.4.1 Duration of Operations 79

6.4.2 Air Quality Guidelines 82

6.4.3 Other Standards 83

6.4.4 Storage of Wastes 85

6.4.5 Site Access and Supervision 88

6.4.6 Monitoring 88

6.4.7 Record Keeping 91

6.5 The Role of the Ministry of the Environment 91

6.5.1 Guidance Manual 91

6.5.2 Ambient Air Monitoring 93

6.5.3 Site Monitoring 94

6.5.4 Inspections 94

6.5.5 Reporting 96

TABLE OF CONTENTS
(Continued)

Page

6.5.6 Use of Existing Waste Disposal Sites 96

6.5.7 Registry of Sites 97

6.6 Air Quality Guidelines for Occupational Health and Safety 97

6.7 Incentives for the Destruction of PCBs 97

7.0 RECOMMENDATIONS 98

7.1 General Approval 98

7.2 Recommendations for Application and Approval Requirements: Technology 98

7.3 Recommendations for Application and Approval Requirements: Sites 99

7.4 Recommendations for Standards for the Operation and Maintenance of Sites 105

7.5 Recommendations Regarding the Ministry's Role 110

7.6 Recommendation for Air Quality Guidelines for Occupational Health and Safety 112

7.7 Recommendation for Incentives for the Destruction of PCBs 112

8.0 APPENDICES

8.1 Guide to Hearings

8.2 Application for Funding

8.3 Public Participation

8.4 Report on Funding

8.5 Appearances

8.6 List of Witnesses

8.7 List of Exhibits

THE COMMISSION ON THE REGULATORY CONTROL
OF
MOBILE PCB DESTRUCTION FACILITIES

1.0 INTRODUCTION

The Commission was established by Order in Council 1772/84 to conduct an inquiry into the proposed regulatory and administrative program proposed by the Minister of the Environment and to make such recommendations as the Commission might deem fit to the Minister of the Environment.

The preamble to the Order in Council identified the need for a safe disposal method for waste polychlorinated biphenyls (PCBs) and the reasons for the public inquiry. Simply stated, the Ministry of the Environment (MOE) has developed a proposed program for the regulation and control of mobile PCB destruction facilities to be located on temporary sites, in order to facilitate the disposal of PCB wastes thereby reducing the risks inherent in storage and transportation of such wastes. Before proceeding with the proposal, the Government wished to involve the public in the development of an effective program and therefore directed the Commission to conduct the public inquiry for that purpose.

The inquiry was the culmination of an extensive public consultation program that commenced with the preparation and wide distribution by the MOE, in February 1983, of a discussion paper on the regulation and siting of mobile PCB destruction facilities. In September 1983, a Ministry Task Force was formed and a public consultation program was developed. Over the next several months the Task Force met with various municipalities, special interest groups, proponents, ratepayer groups, representatives of industry and public utilities and, based on these discussions, made modifications to its proposal. Finally, there were 18 open houses held by the Ministry in those communities that had the largest quantities of PCBs in use and storage.

Nine preliminary hearings were held by the Commission across the province to determine centres of interest. These hearings were extensively advertised throughout the province and, based on these, full hearings were scheduled in three centres in addition to Toronto. There was additional advertising of the hearings in other centres and of the hearings in Toronto.

The Commission is satisfied that the direction of the Order in Council to provide ample opportunity for public input has been fulfilled and the input received throughout the process will result in a greatly improved regulatory program.

The Ministry's proposal is composed of a regulation and an administrative framework to supplement and in some places replace the requirements of existing legislation which deals with hazardous waste. The regulatory program does not deal with specific technology, but establishes requirements that must be met by any mobile PCB destruction facility before being allowed to locate and operate in the province.

The Commission is satisfied that the record of the proceedings of the inquiry is a comprehensive body of knowledge and that its recommendations are based on the best available evidence. The Commission believes that the benefits of the inquiry extend beyond its specific recommendations in that the record of proceedings provides an important collection of state of the art information, concerning polychlorinated biphenyls, dioxins and furans and their relationships to human health and the environment, which could logically form the basis of continuing informed public debate.

The quality of the inquiry and the evidence presented were greatly enhanced by the availability of funds to assist participants with their costs. The funding enabled parties who qualified for assistance to participate to a much greater degree and their participation assisted the Commission by raising and canvassing important issues that otherwise might not have emerged. The Commission's recommendations have been considerably influenced by the evidence adduced by these funded parties, as they have been by the evidence and participation of all parties and participants, and believes that the provision of a fund for intervenors was of incalculable value to the inquiry. The fund was administered by Commission counsel under its direction and he prepared a final report describing the experience and the results of the financial assistance programs. The Commission concurs with his observations and conclusions and includes the Report on Funding as an appendix to this report.

Two main issues emerged in the course of this inquiry into the destruction of PCBs by means of mobile facilities located on temporary sites. These issues may be stated as follows:

(1) can these facilities be operated in a manner that is safe for human health and the environment? and, if so

(2) should applications in respect of specific sites be exempt from public hearings as requested by the Ministry of the Environment, the designated proponent in this inquiry?

All of the issues that emerged during the inquiry were related to these two main issues and were explored and weighed as to their significance to possible impacts on human health and the environment and to the necessity for further site-specific hearings. As issues were raised the Commission evaluated whether these concerns were met by the various aspects of the proposed regulatory program and whether further public hearings would provide additional safeguards.

At the conclusion of the inquiry the Commission was convinced that the regulatory package was generally acceptable subject to the amendments recommended in this report.

All of the Commission's recommendations are interdependent and integral to the acceptance of the proposal, but of overriding importance to the Commission is the recommended regulatory requirement that Class 1 facilities must meet a destruction efficiency for PCBs of 99.9999%. This requirement gives the Commission and the public additional assurances that PCB wastes can be safely and effectively destroyed by mobile destruction facilities in Ontario.

2.0 BACKGROUND ON PCBs IN ONTARIO

The properties of polychlorinated biphenyls and the history of their production and use as industrial chemicals are well documented in the Ministry's proposal (Exhibit 4, Chapter 3) and in the witness statements presented in evidence by experts.

Briefly, PCBs were produced by the progressive chlorination of biphenyl which is a product of petroleum or coal tar refining. PCBs were manufactured with varying physical and chemical compositions. Production of PCBs was worldwide although none were produced in Canada. In North America they were produced from 1929 to 1979 and sold under the trade name of Aroclor. The various mixtures of Aroclors are defined by a four-digit code of which the first two digits represent the molecular type and last two digits represent the percentage by weight of the chlorine content of the compound. Therefore, a compound containing 60% PCB would be designated Aroclor 1260.

Aroclors were sold to various companies who blended them, predominantly, with trichlorobenzene to produce electrical insulating fluids that had various trade names. Askerel is the generic term used to identify the combinations of Aroclor and trichlorobenzene.

The health effects of exposure to PCB will be discussed in detail in a later section of this report but it is important to note at this juncture that the scientific community is in agreement that the toxicity of PCBs is structure-dependent. There are over 200 possible forms of PCBs, each with its own physical and chemical properties. Their toxicity is related to the number of atoms of chlorine and their positions on the biphenyl structure. Studies have demonstrated that there are only 3 or 4 highly toxic PCB analogues, about 8 moderately toxic analogues and the rest, about 197 other PCB analogues, are relatively non-toxic. It was the opinion of toxicologists appearing before the Commission that the moderately toxic compounds are the main contributors to the toxic effects of the commercial mixtures and are present in less than 10% of those mixtures. The highly toxic compounds are probably present in less than 0.1%. Research and study are ongoing to identify more precisely these toxic components and their effects.

Of equal if not greater concern are the structurally similar but more toxic polychlorinated dibenzofurans (PCDFs) and polychlorinated dibenzodioxins (PCDDs). Trace quantities of these chemicals have been found in commercial preparations of PCB and it is speculated that they are the result of heating and cooling, especially in heat transfer fluids where rearrangement and oxidation of PCBs may occur. Evidence accumulated as a result of electrical fires and laboratory experiments also demonstrates that PCDFs and PCDDs are formed under certain conditions by incomplete combustion of PCB materials.

Scientists agree that the toxic effects of PCDDs and PCDFs are also structure-dependent. The most toxic dioxin isomer (isomers refer to chemical compounds that have identical chemical compositions and molecular formulae, but different structures) is believed to be 2,3,7,8 tetra dioxin, the numbers referring to the positions of the four chlorine atoms.

The qualities of these synthetic organic chemicals that made them valuable for industrial use, especially in electrical equipment, are to some degree the very qualities that make them an environmental problem. PCBs are extremely persistent in the environment in that they are not readily bio-degradable; they are fire-resistant; they are generally heavier than water and have a low solubility in water; they accumulate in the body fat of living organisms; and they become more concentrated or "bio-magnified" as they pass up the food chain from one life form to another. PCBs are ubiquitous chemicals in the Ontario ecosystem. Their presence is widespread, found in air, soil, water and sediments, flora and fauna, and human tissue.

According to federal and provincial government statistics, there are over 6,000,000 litres of highly concentrated (60-70%), PCB mixtures in use in Ontario. In addition, there are approximately 500,000 litres of high-level and nearly 1,000,000 litres of low-level (50 parts per million (ppm) to 5,000 ppm) PCB waste materials in storage, awaiting disposal. These figures are regularly updated by government surveys but it is speculated that there are additional quantities of PCB material not yet identified. There is no inventory of the quantity of low-level contaminated oil in service. The statistics indicate that 75-80% of the identified PCB materials are concentrated in 19 municipalities in the province.

The use of PCBs in electrical transformers accounts for the largest (91.7%) proportion of highly concentrated PCBs currently in use in Ontario. The bulk of the rest (7.5%) are in use in capacitors. Although these types of equipment have long life expectancies (30-40 years), many of them have been in service since the 1950's and 1960's and can be expected to be retired from service in the next decade. Environment Canada estimates that all such equipment will be out of service in 30 years. In fact, several representatives of industry and utilities suggested to the Commission that PCB mixtures may be taken out of service at an accelerated rate if a cost-effective method of destruction was available.

3.0 PRESENT LAW AND POLICY

The use and disposal of PCBs in Canada are governed by both federal and provincial regulations and guidelines. Since July 1, 1980, the use of PCBs has been restricted, by federal regulations under the Environmental Contaminants Act, to electrical capacitors, electrical transformers and associated electrical equipment manufactured in or imported into Canada before that date and to heat transfer equipment, hydraulic equipment, electromagnets and vapour diffusion pumps that were designed to use PCBs and were in use in Canada before September 1, 1977.

Although PCB fluids may be reused (i.e. removed, filtered and returned to the same piece of equipment) in the servicing and maintenance of electromagnets, electrical transformers and associated electrical equipment, the use of PCBs as new filling fluid in servicing or maintenance is prohibited. Substitute fluids not containing PCBs must be used for such purposes. The result of these provisions is that eventually, as equipment is retired, the PCBs are taken out of use and must be dealt with in some environmentally safe manner. In Ontario, any substance that contains more than 50 ppm of PCBs is considered to be a PCB substance and must be dealt with accordingly. At present, the options for dealing with such substances are very limited.

There is no facility in Ontario presently licensed to destroy PCB wastes. The only legal options are, therefore, storage or exportation from Ontario. Until May 1, 1980, Canada was able to export PCBs to the USA for disposal. However, regulations under the US Toxic Substances Control Act banned that practice as of that date.

It is still possible to export PCBs from Ontario to other provinces in Canada and PCB wastes are being transported to Alberta for storage there. However, the evidence indicates that this practice is not likely to continue for very long since no licensed destruction facility exists anywhere in Canada, and storage sites are reaching capacity.

Storage in Ontario is also a limited option. The only commercial storage facility in the province is located in Smithville and is not only at capacity but is the subject of great concern by Smithville residents. Such commercial storage facilities at present require a certificate of approval from the Director under Part V of the Environmental Protection Act. Although a public hearing is not mandatory before the issuance of such a certificate, the Director may exercise his discretion to hold one and it is current policy to do so where the facts of the particular case suggest that the levels of environmental risk and public concern are sufficiently high (Exhibit 4, p.48).

Since approved storage sites of this type are essentially non-existent, most storage of PCB wastes occurs at non-commercial sites regulated under Ontario Regulation (O.Reg.) 11/82, as amended by O.Reg. 575/84. This Regulation allows for the on-site storage of PCB wastes which are created when equipment containing PCBs is taken out of service. In fact, present Ministry policy is to require the storage of such wastes at the point of generation except where it can be clearly demonstrated that an environmentally unacceptable condition would result.

If PCB waste is to be transported within Ontario, it would normally be subject to O.Reg. 313 which provides for the tracking of liquid industrial waste through the waybill system. Although a certificate of approval for a waste management system is required for such transport, a hearing is not mandatory and is normally not held when such an application is made. However, where the owner of PCB waste at a storage site under O.Reg. 11/82 wishes to transport the material himself to a site which is not at the point of generation, application for approval may be made instead under that Regulation. Ministerial policy will allow such transportation where there is neither an acceptable storage site at the point of generation, nor the possibility of creating one at that location. That policy also contemplates that approval to transport from such a site to an approved destruction facility could also be obtained by application to the Director for written instructions under O.Reg. 11/82.

The limited and temporary nature of these alternatives has led the Ministry to the conclusion that capability to destroy PCBs in Ontario is needed. At present, any destruction facility, whether fixed or mobile, would require at least two types of approval under Part V of the Environmental Protection Act. Firstly, it would require a waste management system certificate for the facilities, including the equipment for the management and disposal of the PCB waste. In addition, it would require a certificate of approval for each specific site or sites where the technology would operate. The legislation requires that the Director hold a public hearing where there is an application for this type of certificate.

If the facility was a mobile one, it would require a certificate for each of the sites at which it wished to locate. The Ministry contends that the present legislation did not contemplate mobile facilities when it imposed these hearing requirements and the associated notice requirements and that these requirements are not appropriate for such facilities.

Depending upon the circumstances, other environmental approvals may also be required. If air emissions may result from the operation of a facility, a certificate of approval under Section 8 of the Environmental Protection Act would be required. Liquid effluents may require an approval under Section 24 of the Ontario Water Resources Act. Any wastes produced may need to be disposed of pursuant to Part V of the Environmental Protection Act. If the proponent is a public sector proponent, it would be required to comply with the requirements of the Environmental Assessment Act.

Finally, valid applicable federal, provincial or municipal requirements would need to be followed.

The Commission was presented with case law dealing with the respective and sometimes conflicting powers of municipalities under the Municipal Act and the Planning Act and those of the MOE under the Environmental Protection Act to control and prohibit the establishment of waste disposal sites. A further complicating aspect is perhaps the wider powers given to certain Regional municipalities compared to other municipalities. The Commission does not intend to deal with the court decisions as they might be applicable in the choice of sites under the intended regulation. The issue of paramount authority as between the Province and a municipality still remains an issue in certain instances and awaits a definitive resolution of the matter either by legislation or by a court decision.

4.0 THE PROPOSAL

In order to facilitate the use of mobile PCB destruction facilities in the province, the Ministry has proposed a regulatory and administrative program for testing and licencing the operation of such facilities on temporary sites. That proposal as presented to the Commission contained the following key elements:

(a) A specific regulation under the Environmental Protection Act, entitled "Mobile PCB Destruction Facilities". This regulation proposed two classes of destruction facilities: Class 1, which would dispose of PCB waste by incineration or other thermochemical processes; and Class 2, which would dispose of PCB waste by chemical means with the associated organic matrix being recovered for re-use or disposal.

The regulation would exempt such facilities from complying with the public hearing requirements of Part V of the Environmental Protection Act which currently govern all types of waste disposal sites. In place of these requirements, the regulation proposes standards for the location, maintenance and operation of such facilities.

Among the matters dealt with by this proposed regulation are: air emissions of PCBs, PCDDs and PCDFs; solid waste disposal; liquid effluent disposal, on-site storage and handling of PCBs; site access and supervision; separation distances from sensitive receptors; contingency plans; bonding and insurance requirements; restrictions on the maximum frequency and duration of mobile facilities in any particular municipality; and the requirements for record keeping.

(b) A specific amendment to Ontario Regulation 293 under the Environmental Assessment Act to permit the use of public lands for mobile destruction sites without triggering the application of the Environmental Assessment Act. However, public sector proponents of mobile units would still be required to proceed with an application under the Environmental Assessment Act for technological approval.

(c) Procedures designed to enable a proponent of a mobile destruction facility to demonstrate that it can operate in compliance with the proposed regulation and with existing, applicable Ministry guidelines, standards and criteria. These procedures are not proposed for inclusion in a regulation but as a summary of the matters not dealt with by the regulation about which the proponent must satisfy the Ministry before approvals will be issued. These matters include the need for demonstration testing, operating requirements during testing, site selection factors and monitoring and reporting requirements.

(d) An administrative package setting out Ministry requirements and commitments which are not included in the regulation or the demonstration procedures. This package includes application procedures for certificates of approval and matters that may be included as conditions on such certificates. It also includes Ministry commitments regarding public notification, inspections, environmental monitoring, regulation of waste transport and the application of other provincial regulatory requirements.

The overall approach of the proposed regulatory and administrative package is not technology specific. Rather, it is designed to establish standards and criteria which must be met by any particular technology that falls within one of the two broad classes.

Facilities would also be required to comply with any existing relevant law, except where this proposal would exempt them. Further discretionary power is given to the Director to impose conditions or other requirements where this is considered desirable.

The proposal includes elements which are intended to be implemented as regulations as well as elements which are intended as guidelines for administrative practice. All these elements are described in detail in Exhibit 4, as amended during the course of the inquiry. No attempt is made in this report to completely reproduce all the elements of the proposed regulatory and administrative package. However, the key issues are discussed in detail and recommendations are made regarding those elements of the proposal which the Commission considers warrant comment. To the extent that aspects of the Ministry's proposal are not referred to in this report, it can be concluded that the Commission believes that they are satisfactory for implementation as proposed.

5.0 KEY ISSUES

5.1 Jurisdiction of the Commission

Early in the proceedings the Commission requested and received submissions from interested parties to the inquiry as to whether its jurisdiction should include the examination of the questions of need, specific technologies and their economic viability or whether the scope of the inquiry should or could be confined to questions of health, safety and environmental effects.

The Commission concluded that its jurisdiction arose solely from the Public Inquiries Act and the Order in Council that created the Commission. Once the Lieutenant-Governor in Council declared in the preamble to the Order in Council that the problem of the safe disposal of PCB exists, that a program has been proposed to address that problem, and that an ample opportunity should be provided for the public to participate in the development of such a program, the Commission was not required to go further in examining the question of need for the proposal. The jurisdiction, arising from the Order in Council, enabled the inquiry to encompass matters of health, safety and environmental protection. Economic viability and the details of specific technologies would be examined only insofar as they could be related to health, safety and environmental effects.

5.2 Classes of Mobile Facility Sites

Although the Ministry's proposal envisages two classes of mobile destruction facilities, it became evident as a result of the evidence given by representatives of Sunohio, an American firm whose PCBX Division is engaged in the chemical destruction of PCBs in transformer mineral oil, that the Class 2 designation for chemical decontamination facilities might well be further divided into two categories. Class 2 could apply to facilities that treat bulked, low level contaminated wastes. Class 3 could apply to facilities that treat low level contaminated mineral oil in electrical transformers "in situ". This is a closed circuit which is achieved by connecting the decontamination unit directly to the transformer and continuously recycling the oil through the facility until the PCB concentration of the oil has been reduced to acceptable limits. Sunohio officials testified that their process is capable of reducing the PCB concentrations to 2 ppm.

In situ processing has many advantages. It minimizes the risks of accidents and spills because there is no necessity to drain, handle or transport the contaminated material. It offers an economical method of reclaiming oil for reuse and therefore encourages decontamination of PCB materials. It can deal economically with as little as 300 U.S. gallons, about 1200 litres, of oil. It is capable of treating oil with concentrations of more than 2600 ppm and can reduce the PCB concentration down to 2-5% of its original concentration as compared with the 7-10% that bulk processing achieves.

The Commission agrees that a Class 3 category should be included in the regulation for the in situ decontamination of oil in electrical transformers where the oil is to be reused.

Sunohio officials testified that 40-45% of its business is processing contaminated oil in transformers that are energized with up to 69,000 volts of electricity, and the risk of fire is no greater than the risk in a transformer operating normally. Representatives of Ontario Hydro and Rondar Inc., a Hamilton company that services transformers, expressed some apprehension about servicing energized transformers and the Ministry took no position on this issue. The Commission agrees that processing of energized transformers should be permitted if it can be demonstrated to the satisfaction of the Ministry at the testing and approval stages that the facility is capable of safely doing so. The voltage limit should be set at the approval stage.

It was suggested that a Class 3 facility should be allowed to treat oils with a concentration of PCBs of up to 2600 ppm. Counsel for the MOE argued that this limit should be set for each facility at the testing stage and at the application for approval stage. He contended that lower limits may be appropriate for certain facilities. The Commission agrees that the maximum level of concentration of PCBs in the mineral oil that such a facility is allowed to treat should be set at the testing and approval stages and that the level should be a condition on the certificate of approval.

5.3 Health Effects and Air Quality Criteria

In the course of the hearing there was expert evidence presented to the Commission by six eminently-qualified toxicologists, including one engaged by the Commission. These experts greatly assisted the Commission in understanding the potential health effects of exposure to PCBs, PCDDs and PCDFs by reviewing the results of epidemiological and animal studies which are used to assess the risks of such exposure and by analyzing the methodology used to establish the acceptable daily intake upon which the proposed regulatory standards are based. Most of the evidence centred on the expected exposure from air emissions from Class 1 facilities, since this was considered to be greater than the potential exposure from Class 2 facilities.

Because of the importance of the question of human health effects, the Commission decided to engage a toxicologist and requested interested parties to jointly agree to recommend three candidates. Commission Counsel obtained the curriculum vitae of these three individuals, interviewed each of them, and made a recommendation to the Commission, which was accepted. The terms of reference for the Commission's toxicologist, Dr. Robert F. Willes, included instructions to review the evidence of all of the other experts in toxicology or related fields, and to review the relevant scientific literature. He was instructed as well to present expert opinion on the human health and environmental impacts of exposure to PCBs, PCDDs, and PCDFs, and on the adequacy of the standards of the proposed regulatory package. Dr. Willes' witness statement was filed as Exhibit 115.

According to Dr. Willes, the management of risks proceeds through a series of stages. The first two stages are:

(1) The identification of the health problems associated with exposure to the substances of concern, in this case PCBs, PCDDs, and PCDFs, and

(2) the quantification of the risk indicating the confidence or degree of error in the estimate.

These two stages were addressed by all of the toxicologists and tangentially by other experts.

The last two steps in risk management would be, according to Dr. Willes, part of the deliberations of the Commission. These are:

(1) The evaluation of the risks, considering costs and benefits and comparison with other risks, and

(2) the development of strategies to control the risks.

For the most part the experts appearing before the Commission were in agreement on the potential health effects related to exposure to PCBs, PCDDs, and PCDFs. The Commission was told that the data base for these chemicals is as extensive as that of almost any other chemical class and sufficient to develop strategies for regulating the mobile destruction process.

The data from epidemiological studies, i.e. the study of the association between exposure to environmental agents and effects on human health, are preferred, if reliable, in the evaluations of adverse affects by substances on humans. Unfortunately, in this instance, many of these human studies have not been completed or, where studies of accidental or occupational exposure have occurred, it is often not known what other chemical substances were present along with the PCB materials, the strength of the PCB mixtures, or the duration of the exposure. In some cases, such as the studies of Viet Nam veterans, it is too soon to reach conclusions about the long-term effects.

Perhaps the most studied accidental exposure occurred in Yusho, Japan, in 1968. In that incident over 1,000 people ingested rice oil which had been heavily contaminated by PCB heat exchange fluid. Other accidental and occupational exposures have been studied and, although the information is incomplete in regard to the level and duration of exposure, the most commmonly observed and unique health effect is chloracne, a severe form of acne. Other effects linked to human exposure to PCBs, PCDDs, and PCDFs, are dermatological disease, liver and kidney damage, nervous system and endocrine disorders, immunotoxicity and reproductive toxicity. However, except for chloracne, the health responses are not unique to these substances or to particular doses. For instance, a prime effect of these chemicals is on the liver, which can also be affected by a wide range of other materials and these effects have a fairly high incidence in the known populations. Therefore, epidemiological studies may be of assistance but will probably never be completely conclusive.

Occupationally exposed workers with high blood and tissue levels of PCBs have demonstrated few or no symptoms of long-term toxic effects and this would seem to support the conclusion that there are marked differences in the potencies of the components of the various compounds of these chemicals. In fact, from the studies of the Yusho poisoning the consensus is that PCDFs found to be contained in the PCB contaminated rice oil were likely the major cause of the observed toxic effects.

Since epidemiological data are incomplete or inadequate and since it is necessary to evaluate the health effects of exposure to these chemicals, data accumulated from laboratory animal studies has been used to assess the potential risk to human health.

The toxicologists agreed that there is a demonstrated variability in species sensitivity to the adverse effects of these substances and animal studies have borne out this conclusion. For instance, in studies to date, Rhesus monkeys demonstrate the greatest sensitivity to reproductive toxicity whereas rats and mice have been found to be the most sensitive to cancer-producing mechanisms. The carcinogenic properties of the chemicals are the most sensitive indicators and any regulation based on carcinogenic effects should be sufficiently conservative to protect from other adverse health responses.

The majority of the scientists who are most familiar with this field, based on evidence accumulated to date, have concluded that PCBs, PCDFs and PCDDs are non-genotoxic, i.e. not initiators of cancer by direct genetic impact, but are promotors or carcinogenic above a threshold level below which no adverse effects would be observed. It should be noted that the Commission was told that scientific opinion in this regard is not unanimous.

The methodology used to estimate the risks associated with exposure to chemicals thought to be genotoxic is known as a risk analysis. If the chemicals are thought to be non-genotoxic and therefore to have a threshold level for cancer below which there is no observable effect, the NOEL (no observable effect level) approach is taken whereby the thresholds from animal data are extrapolated to humans and adjusted by safety factors to accommodate for species differences, uncertainties in the data and the severity of the effect.

The Commission was told that for the purposes of regulation, in many jurisdictions a risk of 1 in 1,000,000 excess cancers is generally regarded as an acceptable risk. A 1 in 1,000,000 risk is also accepted by society for a variety of commonly occurring circumstances.

The existing provincial air quality guideline for PCBs was developed in 1978-9 on the assumption that PCBs are genotoxic and therefore present a risk at any level of exposure above zero. A risk analysis was carried out translating the data from rat and mice studies into data applicable to humans. The criterion for the annual average ambient concentration was established at 35 ng/m^3 (35 nanograms per cubic metre which is 35 billionths of a gram per cubic metre) and the 24 hour average concentration at 150 ng/m^3. These levels are approximately equivalent to 450 ng/m^3 for a half hour exposure and this is the guideline level. A lifetime exposure to these concentrations would constitute a risk calculated to be .84 excess cancers per 1,000,000 individuals, compared to an existing cancer risk in the general population of approximately 150,000 over the lifetime of 1,000,000 people. Although scientific opinion has changed and PCBs are no longer considered to be genotoxic, the PCB guideline has not been changed to reflect this and is more restrictive than it would be if developed using the NOEL approach.

The toxicologists appearing before the Commission gave no evidence to challenge the air quality guidelines for PCBs as being insufficient to protect human health. There was disagreement, however, with the the proposed guideline for dioxins and furans.

The provisional air quality guideline for dioxins and furans was developed on the assumption that these substances are non-genotoxic carcinogens and as such would be expected to have a threshold level below which no toxic effects would be observed.

The threshold level which was identified by dose-response data for rats was converted to an acceptable daily intake (ADI) level for humans through a body weight relationship and the application of a safety or uncertainty factor of 100. In addition, all dioxins and furans were considered to be as toxic as the most toxic 2,3,7,8, isomer. Because, in fact, the most toxic isomer is believed to comprise a very small percentage of the total potential dioxin and furan exposure and because other isomers are significantly less toxic, this approach was postulated to be extremely conservative and provided for an additional safety factor of at least 10 raising the total safety factor to 1000 or more.

Based on a conclusion that dioxins are 50 times more toxic than furans, a guideline weighted towards PCDDs was developed. As a result, the criterion for PCDDs and PCDFs is a total weighted annual average of 30 pg/m^3 (30 picograms per cubic metre, which is 30 trillionths of a gram per cubic metre).

The annual allowable average for dioxins is adjusted by a factor of 15, a conservative factor given actual testing results, to a provincial air quality guideline of 450 pg/m^3 for a one half hour average at a point of impingement, and, for a mixture of dioxins and furans, a provisional guideline based on 450 pg/m^3 and the 50:1 ratio with furans. The actual modelling procedure is outlined in Exhibit 22.

Dr. Ellen Silbergeld, a toxicologist appearing as a witness for Pollution Probe, disagreed with the use of the NOEL approach for assessing the carcinogenic risk. It was her opinion that the hundred-fold safety factor used for developing the air quality guideline for dioxins and furans was too low for assessing such a severe health influence, i.e. cancer. It was also her opinion that it would be difficult to develop an ambient air guideline that would prevent significant accumulations in the environment.

Dr. Silbergeld proposed that an emission standard be the control mechanism and that for total concentrations of dioxins and furans the emission standard should be 100 pg/m^3, measured at the stack.

Dr. Willes supported the NOEL approach and, although he stated that the choice of safety factors is not governed by "iron clad" rules, but rather by one's judgment and experience, he believed the safety factors used in the calculations were too low at 100 and safety factors of 1000-5000 should have been used. He favoured a 5000 safety factor based on the inadequacies of the available epidemiological data and the severity of the adverse effects.

Dr. Willes expressed a concern that other sources of PCDDs and PCDFs, given their persistence in the environment, should be partitioned off, from the acceptable daily intake and thereby taken into account in the development of the air quality guideline. This concern, for existing contamination or background levels of these toxic substances or existing levels of chemical toxins that might have synergistic effects with emissions from the mobile units, was also voiced by other participants in the inquiry. The residents of the Junction Triangle, an area in west Toronto that is heavily industrialized, and the Metropolitan Separate School Board were particularly concerned with the possible additive or synergistic effects.

Under cross-examination by counsel for the Ministry, Dr. Willes agreed that the bottom line, i.e. the proposed air quality standard for dioxins and furans, is reasonable although he disagreed with the safety factor used. The standard is acceptable because of the conservatism inherent in treating, for the purposes of the guideline, all dioxins and furan isomers as though they were as toxic as the 2,3,7,8 tetra isomer; because sensitive population groups have been considered in establishing the ADI and the 100-fold safety factor; and because the regulatory program (Section 10.3.3(iv)) provides for a consideration of background levels of contaminants in the soil, air and water prior to the operation of the unit.

Dr. Harding, the toxicologist who developed the proposed dioxin and furan standard, and Drs. Safe and Grant, toxicologists appearing on behalf of the Ministry, were of the opinion that the proposed standard was very conservative in that a 100-fold uncertainty factor had been applied and a further large safety factor could be assigned to the assumption that all dioxins and furans would be as toxic as the 2,3,7,8 isomer.

During cross-examination, Dr. Silbergeld, Dr. Willes, Dr. Grant, and, in his examination in chief, Dr. M.A. McGuigan, a toxicologist and pediatrician testifying on behalf of the Metropolitan Separate School Board, agreed that children would be more sensitive to adverse effects from exposure to toxic chemicals than adults, because of their developing and immature physiology. It was argued therefore by the Metropolitan Toronto Separate School Board that special provisions should be included to protect the health of the children.

The Commission has carefully considered the evidence and arguments and accepts the proposed guidelines and intends to recommend their elevation to standards for the purpose of this regulation. The Commission is of the opinion that the assumptions are conservative and adequate safety factors have been included to safeguard the health of even the most sensitive subgroups in the population.

The Commission in reaching this conclusion has also considered the other elements of the program to be dealt with later in this report, which interrelate with the proposed standards and which together form the strategies to control the risks, referred to by

Dr. Willes in his statement on the management of risks. Particularly, the Commission considers that the requirement that Class 1 facilities meet a destruction efficiency of 99.9999% provides an overriding safeguard against any unforseen uncertainties.

5.4 Occupational Health and Safety

Dr. Silbergeld and Dr. Willes raised concerns about the possible exposure of the workers at these destruction facilities to high levels of these chemicals through spills and handling.

Such matters are dealt with by the Occupational Health and Safety Act and its associated regulations, under the jurisdiction of the Ontario Ministry of Labour. It is proposed that these facilities would be subject to these requirements and guidelines in addition to those of the Ministry of the Environment.

For air quality concentrations, the Ministry of Labour recommends a Time-Weighted Average Exposure Criteria (TWAEC) air level of 50 ug/m^3 (50 micrograms is 50 millionths of a gram) of PCBs. This number is equivalent to 50,000 ng/m^3. These are the levels for time-weighted average concentrations for a 40 hour week to which it is believed nearly all workers may be exposed day after day without experiencing adverse effects. The proposal (Section 10.7.2) was amended during the inquiry to indicate that this TWAEC applies provided there is no skin contact with the substances.

This air quality guideline was established as a result of a quasi-judicial hearing by way of an appeal from a Director's Order relative to air concentrations of PCB in a workplace. The employer appealed the Director's Order; the tribunal heard the evidence and established the TWAEC described above, and the Ministry of Labour adopted the number as its guideline.

The TWAEC cannot be described as a "standard" with the force of law that that term implies, although in the opinion of the Ministry of the Environment counsel it can be enforced in the first instance or by a Director's Order.

In order to establish a standard for a substance it must be a "designated substance" under the regulations of the Ontario Health and Safety Act. The Act (Section 1.6) defines a designated substance as "a biological, chemical or physical agent or combination thereof prescribed as a designated substance to which the exposure of a worker is prohibited, regulated, restricted, limited or controlled".

Mr. S. Shrybman, counsel for the Inverhuron District Ratepayers Association and the Environmental Health

Committee, urged the Commission to recommend that PCBs, dioxins and furans be designated under the Occupational Health and Safety Act as a precondition to the operation of at least Class 1 PCB disposal facilities. The Ministry of Labour has no TWAEC for dioxins and furans.

Mr. G.S. Rajhans, Chief of the Occupational Health Hygiene Services Branch of the Ministry of Labour, testified that the levels of PCBs in outside environments would never reach 50 ug/m^3 and in the case of a spill would be closer to 5 ug/m^3.

According to MOE counsel, the Ministry of Labour air quality guideline covers all workers, whether they be workers associated with the destruction process or workers employed by the owner of the site. It does not apply to members of the public if there is public access to the site.

By practice, if air concentrations of PCBs exceed MOE guidelines on workplace property with no public presence, the Ministry of Labour guidelines are applied rather than those of the MOE. However, the natural environment legally includes any outside location even if within the workplace fence line, so the Ministry has the legal ability to control that environment should it wish to exercise it. The Environmental Protection Act gives the Ministry of the Environment jurisdiction over "open air that is not enclosed in a building, structure, machine, chimney, stack or flue" (Section 1(1)(a)).

It was the opinion of the Ministry of the Environment counsel that the Commission's mandate does not provide for comment on the suitability of the Ministry of Labour air quality guideline for occupational exposure or the lack of a guideline for dioxins and furans. The Commission can, in his opinion, recommend the use of MOE guidelines for dioxins and furans until occupational exposure guidelines are developed.

Work practices, for work places where PCB exposure may occur, have been established by the Ministry of Labour and these are laid out in the proposal (Section 10.7.2).

Ms. J. Kidd, on behalf of Pollution Probe, urged the Commission to recommend that the MOE air quality guideline apply to workers at the site, other than the mobile unit workers. Mr. Shrybman urged the Commission to recommend that a formal notice be given to all workers at the site of its proposed use as a mobile PCB destruction site.

The Commission agrees that the Ministry of Labour should be urged to characterize PCBs, dioxins and furans as designated substances for the purposes of the regulations to the Ontario Health and Safety Act and that standards for air quality guidelines be established for these substances in the workplace. In the interim, the Ministry of the Environment air quality guidelines for dioxins and furans should be taken as the occupational health air quality guidelines.

The Commission also agrees that the workers employed by the owner of the specific PCB disposal site, who are not employed in the operation of the destruction unit, should be given notice of the proposed use of the site for PCB destruction.

5.5 Source Sampling and Destruction Efficiency Standard for Class 1 Facilities

The Ministry's regulatory approach would include the monitoring of any waste streams resulting from the operations of the unit. These waste streams would include stack emissions, wastewater discharges, and ash or sludge residues.

The Ministry proposes that sampling and analysis of stack emissions be required during the demonstration testing but not during operation of the facility with, perhaps, one exception. The methodology for ambient air sampling for dioxins and furans is not perfected at present and if this is the situation at the time these units are operational, then stack sampling for dioxins and furans would be conducted once a week during the first commercial operation of the facility.

Air emissions during operation would be monitored by ambient air sampling - that is the sampling and analysis of the air at points of impingement as calculated by the air dispersion model described in O.Reg. 308.

The Ministry's position was that this was the traditional method, embodied in O.Reg. 308, for controlling air emissions in Ontario for all other similar facilities.

Other parties and their witnesses including Mr. E. Oppelt, an expert in hazardous waste treatment and thermo-destruction with the U.S.A. Environmental Protection Agency, Dr. Henning, and Mr. Romano, recommended that during the operation of Class 1 facilities, as well as during the testing phase, emissions be sampled and analyzed at the source, i.e. in the stack, to confirm that the process is operating properly. Reasons given were that these samples would be of actual, undiluted emissions and the results would be more reliable than those of ambient air testing for pollutants where background levels of pollutants, metereological conditions and the topography could affect the concentrations. Since laboratory testing for the dioxins and furans is extremely expensive and results may not be available for two weeks, these parties recognized that continuous stack monitoring would be impractical from a cost and technical point of view. However, the consensus was that stack emission sampling should occur shortly after start-up of operations at any given site and as frequently thereafter as the demonstration testing and other considerations might dictate. Stack emission sampling should also be conducted after any major repairs to the unit have been effected.

The Ministry's position was that if source monitoring is to be recommended it should be required during the first week of operations for the first three sites and no more than twice during the 60 or 75 day operating time. Also, once a satisfactory track record for emissions from the unit has been established, source monitoring should be discontinued. The Commission was told that stack monitoring for dioxins and furans has been discontinued for the ENSCO units since only low levels have been found in the emissions. Ensco Inc. is a company which operates hazardous waste incinerators in the U.S.A.

In any event, the Ministry was of the opinion that stack monitoring, if required, should be in lieu of, not in addition to ambient air monitoring.

Other parties recommended that ambient air monitoring should occur in addition as a back-up control, to detect fugitive emissions not emanating from the stack and to provide added assurances to the public.

The Commission agrees that source or stack monitoring should be conducted during the first 24 hours of operation of a Class 1 facility at each site, after any major repairs to the facility and at least once more during the operational period at that site. This source monitoring regime should continue for at least the first three site operations and subsequently at least once a year on a random basis in order to detect any impact on efficiency by the ageing of the equipment.

An ambient air monitoring regime should be conducted as well but with a reduction in the frequency contemplated by the proposal.

The Commission heard a good deal of evidence in support of the use of a Destruction Efficiency (D.E.) standard in the regulation of Class 1 facilities. The U.S. Environmental Protection Agency regulates the incineration of non-liquid PCBs by requiring that the mass air emissions of PCBs from such an incinerator be no greater than 0.001g PCB/kg (or 1 ppm) of the PCB introduced into the incinerator. This is equated to a destruction efficiency of 99.9999%, referred to as "6 nines" efficiency. The evidence was that the U.S.A. uses this approach to regulate the combustion of both liquid and non-liquid organic substances. The EPA regulation allows for a waiver of the D.E. conditions by the Regional Administrator if the proponent can submit evidence that convinces the regulators that the requirement is not necessary to prevent an unreasonable risk of injury to health or the environment.

The arguments in favour of using a Destruction Efficiency requirement of 6 nines are very persuasive. Of most importance, it would provide a specific criterion for the extent of the destruction required and of the mass load of contaminants to the environment. Mathematical calculations conducted at the hearings using actual test results from an incinerator in the U.S.A. demonstrated that, for those test results, a D.E. standard would be 47 times more stringent than the PCB air guideline of 450 ng/m^3 half hour average. It was agreed that this multiple would change with a different feed strength and facility size, but in all cases a D.E. for mobile units would be much more restrictive than the air quality guideline.

Because there is a possibility of the formation of PCDDs and PCDFs during the combustion process it is not possible to set a D.E. for these substances. Various emission standards for PCDDs and PCDFs were suggested but, because they lacked a convincing scientific basis, the Commission is not prepared to make a recommendation for an emission standard for dioxins and furans.

In any event, the evidence was that the American experience has demonstrated that incinerators that meet a Destruction Efficiency requirement of 6 nines for PCBs also, in fact, minimize emissions of furans and dioxins.

Stack or source emission monitoring should include sampling and testing for PCBs, PCDDs and PCDFs. The process parameters, described earlier, would be defined, at the testing stage, to achieve the required D.E.

Mr. Martin, counsel for the MOE, argued that the ambient air guidelines are the traditional regulatory control mechanism for all other such processes and should be the mechanism of control in this instance. He also argued that if the Commission should chose to recommend the D.E. standard for incinerators, it should provide for the Director's discretion to waive the requirement for other Class 1 technologies.

The Commission was told by U.S.A. regulators, by proponents currently operating in the U.S.A. and by proponents of technologies being developed in Canada that a D.E. of 6 nines is technologically possible. Therefore, there would appear to the Commission to be no good reason for accepting and approving a Class 1 facility that cannot achieve a D.E. of 99.9999% when that technology is available. Therefore, the Commission agrees that all Class 1 facilities must meet a Destruction Efficiency requirement for PCBs of 99.9999% in both the demonstration testing and operational stages.

Mr. Shrybman argued that the D.E. standard should be applied and calculated to include 6 nines destruction considering all the waste streams, i.e. the air emissions, scrubber effluents and all residues. However, there is no evidence that this is possible or practical. The Commission believes that the other environmental standards for wastewater and other residues will provide sufficient protection.

5.6 Separation Distances

The proposed regulatory program sets out separation distances between the mobile units, associated equipment and PCB storage containers, and occupied public buildings, residences, schools, hospitals and establishments involved in food processing.

For demonstration testing, Class 1 facilities must be located at least 500 metres, and Class 2 facilities at least 100 metres, from these sensitive receptors.

For operations, Class 1 facilities are to be located at least 100 metres and Class 2 facilities at least 20 metres from these receptors.

The Ministry's PCB Task Force took the position that the requirements of the regulatory program would ensure the safe operation of Class 1 facilities as close as 30 metres from other land uses. The proposed separation distances were set as "a reasonable buffer zone" to protect health and the environment and to ease the concerns for the risks perceived by the public to be created by these operations. Another consideration was that the Fire Marshall's Act requires a 50-foot separation from hazardous manufacturing processes to sensitive receptors. Finally, the most conservative approach was to calculate the PCB content of air emissions from spills of various sizes of highly concentrated PCB material. The proposed separation distance of 100 metres was based primarily on those spill calcluations.

The evidence of the Ministry witness, Dr. P.K. Misra, was that the largest spill of the most volatile PCB mixture would result in a PCB concentration of 26.0 ng/m^3 at 100 metres from the spill at 30°C, well within the Ministry's air quality guideline of 450 ng/m^3. Dr. Misra's calculations were based on an accepted dilution factor formula developed by Professor D. McKay, of the Department of Chemical

Engineering, University of Toronto. However, Dr. Misra modified the formula to reflect what he considered to be a more realistic vapour pressure and the presence of some liquid phase mass transfer influence. These modifications reflected what he decided was an over-estimation, by about 600 times, of the emissions based on field measurements of spill emissions at the Smithville and Isabella Street storage sites. He acknowledged that the Smithville and Isabella Street data were not complete regarding the nature of the spills and the emergency treatments that might have been used to ameliorate the emissions.

Dr. R.B. Caton, an environmental scientist testifying on behalf the Regional Municipality of Halton, disagreed with Dr. Misra's modification of the McKay formula although he acknowledged that some experts agree that there may be a liquid phase mass transfer in addition to the gas phase mass transfer used in the formula. From his calculations (Exhibit 148), Dr. Caton found that based on a spill of 70% Aroclor, at a temperature of 30°C, and a vapour pressure of 0.2 Pa (pascals), at a separation distance of 275 metres, with an uncertainty factor of 2 applied to his calculations, the PCB concentration would be estimated to be 225 ng/m^3. Should the temperature of the spill containment area increase to 45°C the concentration could increase to 1200 ng/m^3, which suggests that measures should be taken to keep the temperature below 30°C. Dr. Caton, in fact, recommended, and Halton Region supported his recommendation, that the separation distance be 250 metres provided that all containment areas can be restricted to a maximum of 5 m^2.

In addition to the evidence of Drs. Misra and Caton, the Commission received all manner of suggested separation distances with very little or no basis in scientific fact.

On land use planning grounds, the Association of Municipalities of Ontario recommended a 300 metre separation distance for Class 1 facilities, perceiving this to be a generally accepted transitional zone between industrial and residential land uses.

Other recommendations for Class 1 separation distances ranged from support for the 100 metres through 250 metres, 300 metres, 500 metres to several kilometres.

At the request of some of the parties to the inquiry, the Ministry of the Environment constructed models to predict the effects of an explosion or of a fire at one of these sites. These procedures proved to be of little assistance in devising scientifically-based separation distances.

Counsel for the Metropolitan Separate School Board of Toronto argued that mobile destruction facilities should not be operated in the urban area at all but, if they were allowed to operate there, special considerations should be applied in relation to school locations. Since children are more sensitive to the effects of exposure to toxic chemicals and since there are larger concentrations of children in schools, the separation distances for Class 1 facilities from schools should be the greater of 500 metres or two times the separation distances chosen for other uses. For Class 2 facilities the separation distance should be the greater of 100 metres or two times the distances set from residences. He also wanted to ensure that these distances were measured from the perimeter of the school property and that the school should be considered "occupied" if occupied during a 12 month period that a site is used for mobile destruction facilities.

The Commission accepts the experts' advice that children are especially sensitive to the effects of exposure to toxic chemicals just as there are many other especially sensitive groups in the population, the aged, cardiac patients, pregnant women, etc. But the Commission believes that the sensitive groups are present in all population mixes and locations and any standards or protective legislation should be sufficiently conservative that all of these groups are protected and not just those who may be concentrated in one area, as children are in a school. The one or two children who live in a house down the block are just as deserving of attention and safeguarding in this exercise. The Commission does not intend to make any recommendations that leave in doubt the health and safety of any part of the population.

In response to the Metropolitan Toronto Separate School Board's concern with the points of measurement the Commission was told by the counsel for the Ministry of the Environment that the separation distance would be measured from the perimeter of the property of the receptor in question.

The Commission has considered all the evidence and arguments, in regard to this issue of separation distances, given by parties and participants to the inquiry. Since all other recommended separation distances are admittedly arbitrary, the Commission favours the more conservative approach of analyzing the possible air concentrations at certain distances from a spill of highly concentrated PCB materials as a basis for choosing a separation distance for Class 1 facilities. The Commission prefers Dr. Caton's use of the McKay formula by applying the stipulated units and vapour pressures. The Smithville and Isabella Street data are not, in the Commission's view, sufficiently comprehensive or reliable to support a modification which amounts to a divisor of 600 to the results of the calculations based on the McKay formula. On the other hand, Dr. Caton's evidence is very conservative in that he not only uses a conservative approach to the McKay formula but applies the safety factor of 2, thereby reducing, it could be argued, the Ministry air quality guideline by one half, from 450 ng/m^3 to 225 ng/m^3. The Commission therefore will recommend that the separation distance for Class 1 facilities from sensitive receptors be at least 250 metres.

The separation distance for Class 2 facilities is proposed to be 20 metres from the receptors mentioned.

In choosing the 20 metre separation distance, the Ministry recognized the much lower levels of PCB concentrations in the mixtures being processed and hence the much lower emissions to be expected in the case of a spill. The 20 metre proposal would meet the requirements of the Fire Marshall's Act for separation distance from hazardous manufacturing processes.

The Commission heard no evidence that persuaded it that the 20 metres would be inadequate to protect health and the environment and therefore agrees with the proposed 20 metre separation distance for Class 2 facilities.

The Commission is of the view that there should be no requirement for a separation distance from Class 3 facilities to sensitive receptors. It is accepted that the risk inherent in this process of decontamination of in situ transformers is no greater than the risk involved with the normal operation of the transformer.

Mr. J.H. Cullen, a farmer from Paisley, Ontario, requested that farm buildings, feedlots and livestock feed processing or handling establishments be included as sensitive receptors for the purposes of separation distances. He suggested that disposing of PCB materials in rural areas may well return them to the city in the food chain.

The Commission agrees for the most part with Mr. Cullen's concerns and that farm buildings, feedlots and livestock feed processing or handling establishments should be added to the list of sensitive receptors for the testing and operating phases for Class 1 and Class 2 facilities.

The proposed regulation (Section 8.2.8.23) stipulates that every facility and associated equipment, including PCB storage containers, be located at least 100 metres from any watercourse or drainage system, or if less it should be capable of being isolated from them by temporary measures.

The Commission agrees with this separation distance for Class 1 and Class 2 facilities, but believes it should be made clear that the 100 metres separation distance applies without exception to all watercourses and the acceptance of a provision for physical barriers (berms, dykes, etc.) rather than a separation distance is to be available only to accommodate the possibility of the presence of openings to underground storm or sanitary sewer drainage systems which could be blocked off during the operations of the facility.

In the case of a Class 3 facility, treating oil from transformers in situ, the Commission agrees that when the Director is convinced that watercourses and drains can be safely isolated by berms, dykes or other temporary physical means he can so stipulate in the conditions of approval and the 100 metre separation distance would not apply.

5.7 Exemptions from Public Hearings

The proposed regulation would exempt mobile PCB destruction facilities and sites from the provisions of the Environmental Protection Act which require public hearings relative to technological and site approvals. The proposal would also exempt a publicly owned site from the site approval requirement of the Environmental Assessment Act, although public sector proponents of mobile facilities would still be subject to the required public hearing for technological approval.

There were no arguments against the proposed exemption of publicly owned sites from the requirements of the Environmental Assessment Act. The Commission agrees that these lands should be exempted as proposed.

In regard to the proposed exemptions from the hearing requirements of the Environmental Protection Act, the reaction from participants in the inquiry was somewhat mixed. Some parties were satisfied with the provisions, or the provisions with some changes, of the proposal for public involvement without hearings while others urged the Commission not to recommend approval. Some of the reasons given for retaining the legislative requirements for public hearings are:

- the Commission cannot conclude on the evidence that public hearings are costly and time-consuming. One proponent gave evidence that he "hasn't closed the door" on the possibility of proceeding under the present legislation;

- the quality of the licensing process improves with public input and if public hearings are not held, the quality of the licensing process may suffer with ensuing damage to health and the environment;

- public hearings generate specificity in a particular approval regarding a particular technology or site concern;

- if public hearings are not required, public confidence in a consistent and open approvals process will be undermined;

- the ambit of the public participation provision in the Ministry's earlier draft proposals has been curtailed while the proposal itself has been expanded to more than a local solution to a local problem;

- public hearings should be held because the proposed exemptions appear to be contrary to the proposals for public participation put forward in the Government discussion paper, "A Blueprint For Waste Management" (Exhibit 131);

- a site-specific hearing would provide more information in regard to surrounding uses, meteorological data and emmissions, so that appropriate setbacks could be established and mass standards for air emmissions could be set to suit the technology;

The Ministry of the Environment and others in favour of the proposed exemptions submitted that:

- the public hearing requirements of the current legislation were put in place to deal with waste disposal facilities of a permanent nature on specific sites and had not contemplated the possibility of approval requirements for facilities on temporary sites;

- applying the existing requirements would result in repetitive, time-consuming and costly hearings for mobile facilities to be located at different sites; these hearings before the Commission can be taken as an indication of the time and cost that would be involved in site-specific hearings;

- the public inquiry conducted by the Commission has provided for the public examination of and input into the proposed criteria for the regulation of these classes of technology and their site requirements;

- the proposed regulatory program sets out the criteria, supplementary to the existing legislative requirements, which must be met by proponents for technology and site approval, as well as providing the framework within which specific conditions of approval can be applied to each application;

- the public notification sections of the proposal provide for input to the Ministry from the public and other local interests regarding specific application approvals;

- if the costs are too great, PCB destruction will be discouraged rather than encouraged. Some potential proponents told the Commission they would not be able to operate in Ontario if hearings for each site were to be required.

Throughout the course of the inquiry the Commission considered the proposed exemptions from public hearings to be a question of prime importance, second to, but intertwined with the health and safety concerns. The Commission believes public hearings are fundamental to the provincial regulatory and approvals processes and any recommendation for an exemption from the requirements for hearings should be made only if an exhaustive examination of the arguments has convinced the Commission of the reasonableness of such an exemption.

The Commission is of the view that the existing legislation in regard to public hearings was devised to deal with fixed waste disposal facilities with a much longer operational period than the proposed 90-day period in three years in any one selected municipality. Present hearing requirements do not appear to be suitable for a facility that may move from place to place within a few days or weeks. The hearing itself could conceivably consume a much longer time than the operating time on the site if the issues are canvassed to the degree that they have been in this inquiry.

Nevertheless, the relative time and costs involved would not alone persuade the Commission to recommend that exemptions are justified. The question of paramount concern is whether lack of site and technology specific hearings will weaken the quality of the licensing process and endanger human and environmental health and safety.

The Commission is of the belief that the hearings conducted during the course of this inquiry were in the nature of class or generic hearings. The Ministry of the Environment has proposed a regulatory program that is not technology-specific but rather defines two classes of technology for PCB destruction which are thermo-chemical and chemical processes and the Commission has agreed to a third class for chemical treatment of oil in situ transformers. The regulatory program, if adopted as recommended in this report, would provide a comprehensive framework of specific requirements and procedures applicable to all technologies within each of the three classes and, at the same time, would provide opportunities for local input regarding any application for specific site approval. The Director can, within certain parameters set down by the anticipated regulatory program, consider local concerns in his decision to deny or approve an application and, if the application is to be approved, what requirements, additional to those of the existing legislation and this regulation, should be made conditions of that approval. The Commission is convinced that the quality of the licensing process will not suffer and will in fact be improved by the more stringent requirements of this regulation. Public and local government concerns will be addressed through public notification and comments to the Ministry and the specific conditions of approval necessary for each technology and site will be included.

Therefore the Commission agrees with the proposal of the Ministry of the Environment that mobile PCB destruction facilities should be exempted from the provisions of the Environmental Protection Act, requiring technological and site specific hearings.

5.8 Regulation or Administrative Practice

The Ministry's regulatory package as presented to the Commission is a combination of a regulation and an administrative program along with certain elements that are merely suggestions to the proponent. This format created some uncertainty as to which parts of the proposal are requirements, which parts are requirements but with the specifics to be decided later by the Director and which parts are merely guidelines or helpful hints.

The Commission agrees with Mr. Shrybman and others that where a matter can be made a specific and certain requirement it should be embodied in the regulation itself. The regulators, the regulated party and the public should know exactly what is required by law and the placing of specific requirements in the regulation will ensure that the approvals process is consistent and enforceable. For example, the requirements for the demonstration testing of the destruction facilities should be made specific wherever possible and should be included in the regulation.

If a requirement cannot be made specific enough to be part of the regulation, it should be made clear that it is still a general requirement. Where matters cannot be made specific until a particular application has been received by the Ministry, the minimum requirements should, if possible, be spelled out in the regulation. In this case, the ambit of the Director's discretion should be clearly defined along with some detail of the matters to be considered by the Director in exercising his discretion.

6.0 RATIONALE FOR RECOMMENDATIONS

6.1 General Approval

The Ministry's proposal with the increased controls being recommended by this report should provide a regulatory program, for all classes of technologies and sites, that is comprehensive and more specific and restrictive than the requirements of the existing legislation.

The complete regulatory and administrative package, as recommended in this report, would provide a framework for licensing and siting mobile facilities regardless of the specific details of their technological design. The program would set peformance and operational requirements that must be met by any type of technology. This program is designed to accommodate any technology that may be developed.

The Commission heard sufficient evidence from regulators and potential proponents in Ontario as well as operators and regulators of PCB destruction facilities in the U.S.A. to satisfy it that existing technology can be operated within these restrictions. If specific technological designs are for some reason unable to meet the requirements established by this program then they should not be permitted to operate in Ontario.

The experience of the U.S.A. with the incineration of PCB materials has been primarily with fixed site facilities and the Commission was told that these facilities have been operating to the satisfaction of the U.S. regulators. Mr. Oppelt testified that mobile incineration facilities are designed and operated on the same principles as the fixed facilities and have proven to be as efficient. Although the U.S.A. experience with mobile facilities has been limited, testing and some commercial use have demonstrated that these facilities can meet government requirements. Chemical treatment facilities (Class 2) for wastes with low levels of PCB concentrations have operated successfully in the U.S.A. for some time.

The Commission has considered, as well, a primary concern of many parties with the air emissions from Class 1 facilities. The Commission believes that the recommendations for a destruction efficiency standard together with verification by process parameter monitoring and source air emission sampling and analysis provide additional assurance that air emissions will be safely controlled.

The contentious issue of the proposed exemptions from the existing requirements for specific site and technology hearings was broadly canvassed and the Commission is convinced by the arguments that the public involvement in the development of the proposed regulatory package has probably been greater than for any other such government endeavour. Furthermore, the Commission believes that the Ministry has incorporated in the proposal the answers to the concerns of a broad spectrum of the general public. The public notification requirements, including opportunities for public comments on specific Class 1 sites, will provide the mechanism to include requirements in specific approvals to meet legitimate local concerns.

For all of these reasons, the Commission is of the opinion that the two main questions, referred to in the early part of this report, can be answered in the affirmative. Mobile PCB destruction facilities can be operated in a manner that is safe for human health and the environment under this proposed regulatory program with the amendments and conditions recommended by this report. Furthermore, the Commission believes that the proposed program along with the recommendations reflects the results of extensive public involvement in its development and during the inquiry and there is sufficient provision for public involvement in specific applications to obviate the need for further specific site and technology hearings.

6.2 Application and Approval Requirements: Technology

6.2.1 Demonstration Testing

It is proposed that a mobile destruction unit must be proven by demonstration testing, according to the procedures set out in the proposal (Exhibit 4, Chapter 9) to be able to meet the environmental standards, operational controls, monitoring and record keeping requirements of the proposed regulatory package. In certain cases the approval may be granted without testing if the facility has been tested, in a manner satisfactory to the Ministry, in another jurisdiction.

The Commission particularly notes the evidence of Dr. Henning that the proposal provides for a "thorough assessment of any technology which is likely to be applied in the foreseeable future" so long as there are added provisions for a D.E. standard and for measuring source emissions. In addition, Dr. Henning and others underscored the need to be specific in articulating criteria for the approval of facilities without demonstration and the need to ensure that non-test approval would be given only to commercial scale facilities tested or operated in other jurisidictions.

The Commission agrees with these conclusions and will recommend that the requirements for approval for demonstration testing or for the waiving of testing be made specific, wherever possible, and included in the regulation. The criteria should be clearly articulated for the approval of facilities without demonstration.

6.2.2 Application Form

The regulatory program does not include but presupposes an application for approval to waive or to perform a demonstration test and an application for approval for subsequent operations of a mobile PCB destruction unit. A formal application form, included in the regulation, to reflect the requirements of the regulatory program would be helpful to the proponent, to the regulators and, as part of the record, to the public. Such application forms have been developed for other waste management approvals processes and there should be no difficulty in developing one in this instance.

6.2.3 Data Quality Assurance Program

It was proposed by Dr. Frank Henning, a chemical engineer and consultant in hazardous waste management, that the regulation should require the applicant to submit, along with his application, a data quality assurance program. The onus would be on the proponent to set out his plan for developing and reporting data to the

Ministry to meet the requirements of approval. Such a plan would, for instance, include protocols for testing and operating the facility, the capabilities of the laboratory and staff, monitoring and analytical programs, staff training and work place monitoring. This data quality assurance program would have to be reviewed and approved by the Ministry before any approvals for testing or operations would be given. These data requirements are included in the Ministry's proposal or are implied in the areas of Director discretion and the Ministry is in agreement that a data quality assurance program would be beneficial.

The Commission agrees that a data quality assurance program should be submitted by each proponent at a mobile PCB destruction unit, along with the application for approval for demonstration testing and subsequent operations.

6.2.4 Process Parameters

Since different technologies will have different conditions that are critical to the efficiency of the destruction process, the Ministry proposes that safe ranges for process parameters, that would gauge the efficiency of the process, would be established during demonstration testing for each facility. During commercial operation of the facility, the process parameters would be continously monitored and recorded.

For incineration facilities, such parameters would include, among others, combustion temperature, oxygen, carbon monoxide and carbon dioxide concentrations, total hydrocarbons and the flow of neutralizing liquid to the scrubber. The Ministry's proposal requires an automatic shutdown of the PCB feed stream in the event that any one of the parameters being monitored falls outside the approved permissible range.

It is recognized that the process parameters for other technologies and especially for Class 2 batch chemical treatment and Class 3 in situ treatment would necessarily be considerably different than those for an incinerating facility.

It was proposed that a requirement for input feed analysis should be an element of the process to be monitored. Such feed analysis is carried out by U.S. operators of those types of facilities in order to ensure that the PCB feed material is what it is purported to be. In addition, input feed analysis ensures that there are no other substances present that could upset the process. The Commission agrees that input feed analysis should be a requirement of the process monitoring.

6.2.5 Dual Instrumentation

It was recommended by Mr. Lou Romano, Director of Pollution Control for the City of Windsor, supported by others, that dual instrumentation be required for continuous process monitoring, as assurance against the failure of the instrumentation. He also recommended that one set of instruments be sealed to prevent any tampering with the recording devices.

It was the evidence of Mr. Oppelt that dual instrumentation might be an advantage to the operator only in that it would eliminate costly shut-down time in the event of instrument failure. In his opinion, there was no need for dual instrumentation to address any other concerns. The failure of one instrument would trigger the automatic shut down of the PCB feed stream.

Dual instrumentation may not be possible or practical for some technologies, especially for Class 2 facilities such as Ontario Hydro's which is a batch system, and for Class 3 facilities, which may have few if any process parameters of critical concern. In addition, potential proponents told the Commission that their process parameter monitoring is performed by a computer with the capability of registering and alerting the operator to much earlier signs of a trend toward deviation from the approved process parameter ranges.

The Commission is of the opinion that dual instrumentation is not a necessary requirement. If the Director should decide that such duplication is necessary for a specific technology, the requirement for dual instrumentation could become a condition of the certificate of approval.

The Commission also believes that a requirement for one set of sealed instruments is unnecessary considering the other controls and the extent of the inspection of Class 1 sites by Ministry staff, which will be proposed by the Commission later in this report.

6.2.6 Destruction Efficiency Standard for Class 1 Facilities

As discussed earlier, the Commission is convinced that a destruction efficiency standard of 99.9999% for PCBs should be required by the regulation for Class 1 facilities. This equates to a mass air emission standard for PCBs of 0.001g PCBs/kg or 1 ppm of the PCB introduced into the facility.

6.3 Application and Approval Requirements: Sites

6.3.1 Class 3 Sites

The Commission agrees that a third category, for Class 3 sites, should be included in the regulation as discussed earlier in this report.

6.3.2 Public Notification

Since the Ministry's proposal includes exemptions from the requirements of the Environmental Protection Act for public hearings for site and technological approvals and since the Commission has agreed with these exemptions, it is doubly important that the provisions (Section 10.3.1) for public notification and comment are adequate.

The regulatory proposal requires a proponent to obtain any required local municipal approval and suggests that advice on potential sites be sought from local officials. After receiving authorization from the Ministry for a demonstration test the proponent must notify the local municipal Clerk in writing of the test at least 30 days before the test begins.

The proposal requires that the proponent of a Class 1 facility must give notice in writing to the local municipal Clerk and the Medical Officer of Health at least 30 days before a certificate of approval can be issued. The Notice must also be advertised at least 3 times in a daily newspaper circulated in the municipality and written public comment will be invited to be received by the Ministry within 30 days of the last day of the newspaper publication of the notice. The Ministry will consider any written comments received prior to approving or denying approval of the site.

The Commission heard a good deal of evidence, discussion and many recommendations concerning the length of the notice and comment period and heard recommendations for the establishment of municipal liaison committees of varied compositions to provide comment to the Ministry and to monitor the operations of the facility.

The Commission is of the opinion that a period of 60 days would be a more appropriate period for notice and comment on a Class 1 application. The Commission also believes that a liaison committee should be established to review the application and to make recommendations to the Ministry. Such a committee should be composed of one representative each of the applicant, the local municipality and the Ministry of the Environment. If the local municipality is located in a regional municipality that has been given the responsibility for waste management the regional Clerk should be notified as well as the local municipal Clerk and a regional municipal representative should be appointed as well as a local municipal representative to the liaison committee.

Some parties argued convincingly that the notice requirements for Class 1 sites should be extended to include notice to the landowners or tenants of land adjacent to the proposed site and to the Director of Education. In addition, they argued, if the site is part of an industrial establishment, all workers associated with that workplace should be given notice in accordance with the provisions of the Occupational Health and Safety Act (Section 29, subsection 5), by posting notice in the workplace. The proposed requirements for the composition of the notice should be expanded to include the nature of the waste to be disposed of, whether it is of high or low level PCB concentration, and the schedule of operations. It was also proposed that a public repository for documents be established at the time of the giving of notice so that interested persons would have the opportunity to examine the application and relevant documents. The Commission agrees with these proposed changes to the notice requirements for Class 1 facilities.

6.3.3 Upper-Tier Municipalities

The submissions of the Region of Halton (Exhibit 141) and the Region of Hamilton-Wentworth (Exhibit 180, W.S.-27) included requests that the Ministry's proposal be changed in the appropriate places to reflect upper-tier municipal involvement. Both of the aforementioned submissions identified specific areas in the proposal where these changes should be made in order to ensure that the upper-tier government is properly informed and involved in the approvals process. It was suggested that one solution might be to include a definition of an upper-tier municipality in the beginning of the regulation. The Ministry is in agreement with the general tenor of these suggestions but wishes to retain the emphasis on the local municipality in certain instances, such as the power given to local municipalities to veto the extension of operational periods in their municipalities. It appears to the Commission that the question of how to ensure that regional government is involved in the approvals process can best be resolved by amending the appropriate, specific sections of the proposal and the Ministry has agreed to do this.

6.3.4 Separation Distances

The issue of separation distances of these facilities from sensitive receptors was discussed earlier in this report and the Commission is convinced that the separation distances from sensitive receptors for Class 1 facilities should be increased; the list of sensitive receptors should be expanded to consider rural settings; the separation distances proposed for Class 2 should be adopted and there should be no requirements for separation distances for Class 3. The proposed requirement for a separation distance from watercourses was also discussed earlier and the recommendations in that regard will be included.

6.3.5 Contingency Plan

The proposed regulation (Section 8.2.9) requires that all applications include contingency plans outlining the actions the operator will take to deal with emergencies such as spills, fires, vandalism, etc.

The Region of Halton recommended that it be allowed to participate in devising such contingency plans and that regional approval should be required for these plans to ensure the fulfillment of the regional mandate under the Emergency Plans Act.

The Commission notes that the proposal (Section 10.2.2) requires that a proponent must submit, in support of a request for approval to operate at a specific site, copies of letters of transmittal of the contingency plan filed with the local Clerk, police and fire officials and the local Medical Officer of Health, and the Commission agrees that this requirement should be amended to include both tiers of municipal government. If any of these municipal officials have concerns about the proposed contingency plan they can submit proposed changes to the Minister for his consideration.

It was argued by one party that the contingency plan (Section 8.2.9(1)) should include a reporting protocol to be followed in the event of an emergency. The protocol should require notification to the Ministry of the Environment within 2 hours of the emergency occurrence by telephone, within 2 days with a written report and within 2 weeks with a final report. This is the protocol embodied in similar U.S. Environmental Protection Agency regulations. Although counsel for the Ministry of the Environment argued that such immediate reporting is already required by the Environmental Protection Act, the Commission believes it would be beneficial to include a specific reporting protocol in the contingency plan required by this regulation. The Commission refrains from stipulating specific times since notification should be as immediate as circumstances allow.

6.3.6 Performance Bond

The proposed regulation contemplates the posting of a sum of money or a bond or personal sureties in the minimum amount of $50,000 to be used for site restoration if necessary. This provision would not apply to municipalities. The amount could be increased by way of a condition attached to the certificate of approval where it was considered necessary by the Director because of specific site features.

The MOE's proposal ties the bond to the site so that each site would be protected. The Commission heard argument that this concept would be too onerous where Class 2 and Class 3 operations are concerned. Whereas a Class 1 incineration unit would probably be in operation for a relatively longer period of time and involve a more intense and potentially more environmentally disturbing operation, this was not the case in respect of the other two classes. The recommendation made was that in the case of Class 2 and Class 3 units the amount of the bond be tied to the unit rather than to the site no matter how many sites are serviced by a particular unit. The Commission accepts this recommendation.

Ontario Hydro pointed out that the setting of the regulatory minimum amount of $50,000 was in response to public concerns about the operation of facilities by the private sector. It now requests that the proposed regulation be altered so that the Director be given discretion to vary the amount of the bond not only upwards but, as well, downwards in order to accommodate a public utility such as Ontario Hydro by requiring a bond of a lesser amount from it. In the alternative, it suggests that a public utility be placed in the same category as a municipality and be exempted from the bond provision entirely. While there may be merit in this submission, the Commission notes Section 34 of the Environmental Protection Act which imposes a bonding obligation on all applicants except municipalities. The Commission takes this provision as the considered expression or policy of the Legislature and for that reason is reluctant to accede to Ontario Hydro's request. With regard to the suggestion of varying the amount of the bond downwards, the Commission notes that Ontario Hydro is developing a Class 2 facility and a $50,000 bond tied to such a facility that could service several sites is not unreasonable.

6.3.7 Insurance

Evidence was presented to the Commission as to the possible types of insurance coverage that would be required for the operations contemplated in the proposed regulation. These are Automobile Liability, General Liability and Environmental Impairment Liability.

Automobile Liability Insurance would offer protection for the transportation of equipment and waste involved in the operations and the Commission recommends that the amount of such insurance be left to the Director's discretion. The other two types of insurance would provide coverage for bodily injury and property and environmental damage resulting from fires, explosions, spills, leakages and pollution. General Liability Insurance addresses sudden and accidental occurrences whereas Environmental Impairment Liability coverage is protection against non-sudden or gradual pollution. The evidence heard by the Commission was that the General Liability policy has become very expensive and the Environmental Impairment Liability policy has become virtually impossible to obtain at the present time.

It is the opinion of the Commission that the public should have assured redress where bodily injury or property or environmental damage results from the handling or destruction of PCBs. This redress or compensation must be provided in one form or another whether by insurance or a fund created by the proponents and/or the Government or by whatever other means. It would be unthinkable to leave the public without a recourse to some form of compensation in the event of a mishap.

6.3.8 Boundaries for Consolidation of PCB Wastes

Although the representatives of a few municipalities that appeared before the Commission took the position that only wastes generated in their municipalities should be destroyed there, it was recognized by most that there is a need for flexibility in order to ensure the economic viability of the destruction units and the efficiency of the processes. The Association of Municipalities of Ontario recommended that sites capable of servicing more than one municipality should be chosen in order to reduce the time and expense necessary for site selection and facility set-up and to encourage more efficient operation and better site preparation.

The Ministry took the position that serious attempts should be made to localize or regionalize wastes for destruction sites. Under its proposal, the applicant will be required to identify the sources of the wastes to be destroyed and a certificate of approval will identify the sources and the amounts that can be accepted for destruction. In this manner, the certificate of approval will guard against unjustified transportation over great distances.

There is no control over the timing or the location of PCBs coming out of service. The locations of large concentrations of PCB wastes in storage at this time has been identified but the logical future siting of destruction facilities may change if an approvals process for mobile units is in place and acts as as incentive for the removal of PCB materials from service.

The fears of the municipalities that would confine the source of wastes to be destroyed to within their municipal boundaries should be assuaged by the restrictions inherent in the proposed regulatory program, which limit the duration and frequency of operations of these units in any one municipality. These restrictions should suffice to limit the amount of consolidation and hence the transportation of PCB wastes across municipal boundaries.

The Commission will, therefore, accept the Ministry's position in this instance and make no recommendations that would restrict transportation or consolidation of wastes relative to municipal boundaries.

The Commission believes, that in view of the temporary nature of the facilities to be regulated by this proposal and in view of the rationale for the regulatory program to effectively deal with PCB wastes in the Province of Ontario, there should be a provision prohibiting the transportation of PCB wastes across the provincial borders into the Province for destruction by these facilities.

6.3.9 Operator Training

The operator must submit documentation to the Ministry along with an application for approval (Section 9.3.3.) to the effect that the operators of the mobile unit have been properly trained to operate the facility under normal and emergency situations. The requirements for this documentation are to satisfy the Ministry that competent staff are operating the unit.

The Region of Halton proposed that a licensing program be established, for the owners, managers and operators of fixed and mobile PCB destruction equipment, through the Ministry of the Environment or through a Community College, with minimum standards and periodic testing.

The Ministry maintained that the information required to be submitted is sufficient for the Director to make a decision on the competency of the staff. It was also contended that the owners of these facilities will protect their large investments in equipment by ensuring that operating staff are competently trained. Certification of staff is required in some other areas, such as in the pesticides field where anyone with a minimal investment can use dangerous chemicals, but such is not the case here. Ministry counsel argued that it would not be worthwhile to have any type of community college course established because the small number of people likely to be involved with the operation of these facilities would not warrant it.

The Commission accepts the Ministry's argument and supports the Ministry's recommendations.

6.4 Standards for the Operation and Maintenance of Sites

6.4.1 Duration of Operations

The proposed regulation (Section 8.2.6) requires that a mobile PCB destruction facility be removed from a site within 90 days after the start of the installation at the site. Where it is the first year of operations in a local municipality it may not be operated for more than a total of 1800 hours (75 days) and, for subsequent operations, no more than 1400 hours (60 days). These are aggregate figures applying to all sites of the same class within a local municipality. A longer period of operations may be approved by the Regional Director and the local municipality in which the site is located.

The evidence was that the processing of contaminated oil in transformers in situ by Class 3 facilities can be completed in a few days. The

Commission agrees therefore with the proposal of one party that the duration of the operation of a Class 3 facility at any one site be limited to 7 days (168 hours). A longer period may be permitted, on prior application, by the Director and the local municipality in which the site is located if they deem it necessary.

Class 1 sites may be located in a local municipality only once every three years and Class 2 sites may be located in a local municipality only once each year. Again, the Director and the local municipality may give prior approval for more frequent site locations.

The evidence was that the risks of the operation of a Class 3 facility are comparable to those of a transformer in normal use and the duration of the processing period is to be confined to very short periods of time. Therefore the Commission will recommend that there be no limits applied to the frequency of operations of Class 3 facilities in a local municipality.

It was suggested, and the Commission agrees, that regional government approval, for extensions of operating times for all classes of facilities or for more frequent siting of Class 1 and Class 2 facilities, should also be required if the particular regional government has been given responsibility for waste disposal.

These limits to the duration and frequency of operations were set in order to ensure that the facilities operate as temporary rather than fixed site facilities. The actual times were not predicated by health and safety concerns although the Ministry counsel noted, in final argument, that emission standards were based on their safety as though the machine would be sited permanently. This conservative approach provides for additional safety factors when one considers, for instance, that the allowable maximum of 75 days of operation, once in three years, is equal to 7% of the time that a fixed facility might operate in that time period.

Many of those parties addressing the question of the duration of the time that a facility could remain at a site agreed the 90 days should be extended for up to 6 months or 180 days because of the possibility of equipment breakdown and the subsequent downtime for the machinery.

For the actual operating times of 60 and 75 days, most of the parties and the proponents were of the opinion that these periods of times were reasonable. Only one proponent specifically requested that the operating time limited be extended.

The Commission is of the opinion that the provisions of the regulation are adequate and workable and notes that the Director and the local municipality have the power to extend these time constraints if they are persuaded by the arguments of a proponent.

Halton Region recommended that operations be restricted to 12 hours a day and five days per week. However, it appears to the Commission that adequate supervision can be provided for a 24 hour a day operation and that it would be impractical if not impossible for many technologies to shut down and then start up again after a 12 hour interval.

6.4.2 Air Quality Guidelines

As discussed earlier, the Commission agrees with the Ministry's proposal to incorporate in the regulation (Sections 8.2.8.1, 8.2.8.2, and 8.2.8.3) the existing air quality guidelines for PCBs, PCDDs, and PCDFs. The placement of these guidelines in the regulation will establish the guidelines as standards and will provide for quicker and more effective enforcement than might be the case if they remain as guidelines only. It was suggested by Mr. Shrybman that the Commission should recommend that these air quality guidelines be incorporated in O.Reg. 308 of the Environmental Protection Act, but the Commission heard little argument or evidence in this regard and believes its mandate will be fulfilled by the incorporation of these guidelines in the PCB regulation.

6.4.3 Other Standards

The Ministry has also proposed standards for solid and liquid wastes in the regulation (Sections 8.2.8.4, 8.2.8.5, 8.2.8.6). Solid wastes originating from the operation of a mobile PCB destruction facility are to be disposed of in accordance with their PCB concentration. If the concentration is 50 mg/kg (50 milligrams per kilogram) or less than they are to be disposed of in a properly certified waste disposal site as a non-hazardous solid industrial waste. Where the concentration is more, then O.Reg. 11/82 applies to its storage, transportation and disposal.

Various methods of discharging of wastewater containing concentrations of up to 5 ug/L (5 micrograms per litre) of PCBs are set out in the regulation and are either authorized by the certificate of approval or in written instructions from the Director. These methods are: discharge to a municipal sewage treatment plant, directly into water or by spraying on soil. Where the concentration exceeds 5 ug/L of PCBs, the wastewaster must be treated by either removing or destroying the PCB concentration to a level of less than 5 ug/L and then the wastewater may be discharged as set out.

Dr. George Dixon, an aquatic toxicologist brought by Pollution Probe, was of the opinion that the regulations concerning PCBs in wastewater are adequate, in fact conservative, to effectively protect the aquatic environment. He was concerned, however, with the proposed discharge of wastewater containing PCDD or PCDF concentrations equal to or less than that of the receiving water.

The Commission understands that the Ministry is agreeable to deleting a part of Section 8.2.8.6(iii) so as to prevent the discharge of any wastewater containing detectable chlorinated dibenzodioxins or chlorinated dibenzofurans into water.

Dr. Frank Henning proposed that dilution be prohibited as a method of meeting allowable discharge concentration levels for liquids or solids. He recommended that appropriate sections be added to the regulation to this effect.

The Commission understands that the Ministry is agreeable to adding a statement that dilution is not acceptable, to Section 8.2.8.4, dealing with solid waste, and to Section 8.2.8.6, dealing with liquid effluents.

6.4.4 Storage of Waste

If a mobile destruction unit is to be operated at an existing PCB waste storage site established under O.Reg. 11/82 or by a certificate of approval specifying the manner in which PCB wastes may be stored, the requirements of O.Reg. 11/82 or the certificate of approval apply. If the unit is to operate at a site established for its use, the requirement of the proposed regulatory program would apply.

There were three major areas of discussion related to the storage provisions in the proposed regulation:

(1) The requirement (Section 8.2.8.10) for the provision of a spill containment system, by means of a spill collection tray system or an impoundment on an impermeable pad or floor, with the capacity to contain 100% of the volume of the stored liquid waste,

(2) the provision (Section 10.5(a)) that the volume of waste stored at the site should not exceed the volume required for 5 days of continuous operation. The volumes permitted to be stored may be increased in certain situations and this would become a condition on a certificate of approval.

(3) the need to prevent the collection of snow or rainfall in the containment system.

Certain potential proponents testified that the 100% containment provision would be unrealistic where the waste is stored in drums since it would be highly unlikely that all of the drums would rupture at the same time. Class 2 proponents believe that the 100% containment requirement is excessive for low level waste.

Other parties preferred to have the 100% containment rule retained for obvious safety reasons.

The Commission will recommend that the regulation (Section 8.2.8.10) be amended to provide that the Director may approve a reduction in the provision for 100% containment capacity, in response to a written application from the applicant containing reasonable and safe alternatives for reducing the containment requirement. This recommendation appears to be consistent with the provisions of O.Reg. 11/82 which does not specifically require 100% containment for PCB storage areas.

The arguments for allowing the Director the discretion to increase the volumes of waste to be stored at a PCB waste disposal site are convincing. The amount to be stored needs to be directly related to the size of the destruction unit and its throughput capacity. Larger volumes may be necessary for the economic viability of the operation and, may, at the same time minimize the risks associated with transportation and handling.

The risks of storing larger quantities must also be considered.

The Commission supports the recommendation for a limit to the volume of waste to be stored on site to the volume required for five days of continuous operations with a provision for the Director to increase the amounts to be stored as a condition of approval under certain circumstances and with adequate safeguards in the contingency plans and containment provisions. This provision for a limit to the volumes of wastes to be stored on site should be included in the Regulation rather than in the administrative package.

The proposal (Section 9.3.2) refers to the need to prevent snow or rainfall from being collected by the storage containment impoundments or spill trays. The use of temporary shelters to be deployed during snow or rainfalls is recommended and, in the alternative, collected precipitation must be treated, analyzed and disposed of as an aqueous effluent of the facility.

Although certain parties to the inquiry expressed the opinion that temporary shelters should be mandatory, the Commission agrees with the opinion of Ontario Hydro that this may not always be practical or necessary, depending on the nature of the facility. However, the Commission believes that the requirement for temporary shelters or alternatives for dealing with collected precipitation should be included in the regulation.

6.4.5 Site Access and Supervision

The proposal (Section 8.2.8.16) requires that sites be enclosed to prevent entry by unauthorized persons and that access be controlled by a gate capable of being locked. The Commission agrees with this requirement for Class 1 and Class 2 sites but is of the opinion that the requirement is unnecessary and impractical for Class 3 sites. The provision (Section 8.2.8.17) that all sites be continually supervised should be adequate for the security of a Class 3 operation.

6.4.6 Monitoring

Pre-operational, operational and post-operational monitoring are required by the Ministry's proposal (Section 10.3.3), in accordance with the sample collection and analysis methods stipulated in the proposal (Chapter 9).

As stated earlier in this report, the Commission believes that a destruction efficiency standard of 99.9999% should be a requirement for Class 1 facilities and that the most reliable methods of verification of the D.E. are through process parameter monitoring and the sampling of air emissions at the source. Sampling and analysis of source or stack air emissions should occur during the first 24 hours of operation of a Class 1 facility at each site, after any major repairs to the facility and at least once more during the operational period at that site. This source air emission monitoring regime should continue for the first 3 site operations and subsequently be performed at least once a year on a random basis.

The process itself is to be continuously monitored by the monitoring of certain process parameters, defined at the testing stage, to ensure that the process is operating efficiently and meeting the standards set by the regulatory program. The requirement for process parameter monitoring includes a requirement for automatic shutdown of the PCB feedstream to the facility if parameter ranges are not being met. The Commission is of the opinion that the process monitoring should include an analysis of the input feed materials to ensure that the PCB feed is of the concentration expected and to ensure that other unwanted substances are not entering the process. In addition, the requirements for continuous process monitoring including the automatic shutdown provision should be placed in the regulation.

The Commission is in agreement with the requirements for the monitoring of the aqueous effluents and solid wastes (Section 10.3.3 (ii) and (iii)) with the exception that all aqueous effluents should be sampled and analyzed for PCBs, PCDDs and PCDFs before discharge rather than on a "regular basis" as proposed. The provision for monitoring of liquid and solid waste should be included in the regulation.

An additional monitoring requirement should be included for Class 3 facilities. The Sunohio representatives testified that there is a certain amount of leachback of PCBs into the decontaminated mineral oil from the coils of a transformer. The evidence was that since the Sunohio decontamination process can reduce PCB concentrations down to 2 ppm, the leachback does not bring the treated oil to levels that would be considered PCB substances, at 50 ppm. It was proposed and the Commission agrees that the oil in transformers processed by a Class 3 facility should be tested for PCB content 90 days after the decontamination process and, if found to be below 50 ppm, the oil would be declassified as a PCB substance.

6.4.7 Record Keeping

The Commission agrees, with two exceptions, with the proposed requirements for record keeping (Section 8.2.4) by the operator of a mobile PCB destruction facility. Firstly, the operator should include in his records (Section 8.2.4(1)) the name of the owner of the PCB waste disposal site and a record of every process upset, breakdown, accident or spill that occurs at the site. Secondly, the operator should be required to retain his records for at least 5 years after the submission of the required written report to the Ministry, not 1 year as the proposed regulation now stipulates.

6.5 The Role of the Ministry of the Environment

6.5.1 Guidance Manual

The Commission considers that the Ministry should prepare a guidance manual, which would set out a detailed and systematic approach for reviewing and evaluating the information provided in applications for approvals. Such a manual is used by the Environmental Protection Agency in the U.S.A. for the evaluation of permit applications for the operation of incinerator units and excerpts of that manual were introduced in evidence (Exhibit 128-C).

The guidance manual would ensure consistency in the application of the approvals criteria by Ministry staff by making the specific requirements for information on testing and operating procedures clear to both the regulators and the proponents. For example, the manual would set forth the process to be used for the evaluation of information submitted in an application for the acceptance of the results of testing in another jurisdiction in lieu of the requirement for a demonstration test in Ontario. It would address, among other issues, the criteria used for evaluating similarities in process design, the similarities in composition and strength of feed materials used in prior tests, and the acceptable ranges for combustion and temperature zones.

The manual would be a benefit to the proponent in that it would clearly delineate the evaluation process so that he would know what is required in the application documentation before he embarks on a costly presentation.

In addition and of equal importance, the manual would be beneficial to any interested parties or the general public in assuring them that a consistent policy was being applied to the approvals process.

The Commission understands that the U.S. Environmental Protection Agency regulatory process is decentralized with applications being processed at the regional level and consistency in applying policy may be more difficult to achieve for that reason. The Ontario approvals process is centralized and the policy should be more easily applied in a uniform fashion. However, the proposal for a guidance manual would appear to have merit and the Commission recommends that the Ministry develop such a manual.

6.5.2 Ambient Air Monitoring

The provisions for the monitoring of ambient air by the Ministry of the Environment (Section 10.3.3(i)) are extensive and were developed without consideration of the requirements for source sampling and analysis of air emissions and for a destruction efficiency standard, which requirements are now being recommended by the Commission.

Therefore the Commission is of the view that with the requirements for a destruction efficiency standard and for the sampling and analysis of air emissions at the source, the proposed provisions for ambient air sampling and analysis can be reduced. Since the Commission has no scientific evidence upon which it can rely to make a specific recommendation, it will leave the provisions for the extent of ambient air sampling and analysis to the discretion of the Ministry of the Environment, assuming that such monitoring will occur with sufficient frequency to detect fugitive emissions from the destruction facilities and to provide added assurance to the public that air quality is not being adversely affected.

6.5.3 Site Monitoring

The Commission agrees with the provisions for pre and post-operational site monitoring (Section 10.3.3(iv)) to be carried out by the Ministry or a Ministry contractor. Samples of air, soil and waters will be collected at the site and in the vicinity of the site before and after operations and will be analyzed for PCB content.

6.5.4 Inspections

During the demonstration testing, Ministry staff will be present to witness and inspect the testing procedures. The agreement between the operator and the Ministry, covering the terms of the demonstration test, will authorize the Ministry to order a shut-down of testing if conditions of the agreement are not being met.

The proposal indicates that during the operations of any facility, the Ministry will have properly trained staff inspect the facility on a daily basis the first time the facility operates commercially in the Province. Ministry staff will also inspect the facility at least twice a week during subsequent operations at each new site. Any violations of the conditions of approval, which stipulate a shut-down if violated, may cause the Ministry to shut down the facility immediately.

The Ministry or an authorized contractor will inspect mobile PCB destruction facility sites within seven days of the cessation of operations to ensure that the environmental quality has not been impaired.

Parties to the inquiry urged the Commission to recommend that trained Ministry inspectors be present at the site at all times of operation of Class 1 facilities and the Commission agrees with that recommendation.

The Commission will recommend that the inspection regime as proposed by the MOE be applied for Class 2 and Class 3 facilities and that these inspections be conducted on a random basis and include evening and night inspections if facilities are operating 24 hours a day.

The Commission also agrees, in part, with a recommendation of the Region of Halton that, rather than the start-up inspection being the sole responsibility of the operator, prior to the beginning of PCB destruction at any site a properly trained Ministry inspector examine the completed installation for defects in the equipment and ensure that, if necessary, appropriate remedial action is taken. The Commission believes that the start-up inspections by the Ministry should occur on Class 1 facilities only and that the inspections proposed by the Ministry are sufficient for Class 2 and Class 3 facilities in this regard.

6.5.5 Reporting

The proposal (Section 10.3.4) provides that the Ministry will report the results of environmental monitoring analysis to the public within 1 year of cessation of operation of facilities at any site.

The Commission believes that such a report should be released within 3 months of the cessation of operations of facilities at any site.

6.5.6 Use of Existing Waste Disposal Sites

A suggestion included in the proposal was that potential proponents should investigate the possibility of using licensed waste disposal sites as sites for Class 1 or Class 2 mobile PCB destruction sites. This suggestion has merit in that an existing disposal site would have seemingly met criteria that could be used in seeking a site under the proposed regulation. In addition, it has the advantage of using a site already in operation rather than establishing a new one.

There are legal implications of such a move that should be considered by drafters of the regulation. An application to add a waste management system to an existing operation would trigger a hearing under the Environmental Protection Act, which the new regulation is designed to avoid. The new regulation should also be designed to avoid this possibility and to avoid any risk of a licence for an existing operation being expanded in a manner that would allow a permanent operation of the mobile destruction facilities at such a site.

6.5.7 Registry of Sites

The Commission agrees with a suggestion that the Ministry keep a central registry of sites that have been used as mobile PCB destruction facility waste disposal sites.

6.6 Air Quality Guidelines for Occupational Health and Safety

Further to discussions of the Occupational Health and Safety Act requirements that relate to PCBs, PCDDs and PCDFs, the Commission agrees that the Ministry of Labour should be urged to develop air quality standards for these substances in the workplace.

6.7 Incentives for the Destruction of PCBs

Further to submissions made to the Commission that legislation in the U.S.A. requires that PCB wastes must be destroyed after one year of storage and that a phasing out of transformers and other equipment containing PCB mixtures has been legislated to begin 1988, the Commission is of the opinion that the Ministry of the Environment together with Environment Canada should consider similar incentives for the removal of PCBs from storage and use when suitable PCB destruction facilities are available.

7.0 RECOMMENDATIONS

7.1 General Approval

The Commission recommends that the proposed regulatory program (Exhibit 4 as presented and amended at this inquiry) for mobile PCB destruction facilities operating on temporary sites in Ontario be approved subject to the amendments and conditions included in this report.

7.2 Recommendations for Application and Approval Requirements: Technology

(1) That all demonstration testing requirements and criteria to be met for approval of facilities without demonstration testing be made specific, where possible, and included in the regulation. Tables 9.1 and 9.2 (Exhibit 4) outlining the sampling and testing protocols should be included in the regulation along with the other requirements.

(2) That the Ministry develop a formal application form for approvals under this regulatory program and such application form be included as an appendix to the regulation.

(3) That the proponent be required by the regulation to submit a data quality assurance plan at the time of application for approval to waive or to conduct demonstration testing and subsequent operations.

(4) That a destruction efficency standard of 99.9999% be proven during demonstration testing of Class 1 facilities and that such a standard, equating to a mass air emission standard for PCBs of 0.001g PCB/kg or 1 ppm of the PCB introduced into the facility, be included as a regulatory requirement for operations of these facilities. Process parameters to achieve the required destruction efficiency must be established during demonstration testing and be continuously monitored during operation of the facilities. Sampling of source emissions during testing must demonstrate that the required D.E. can be achieved.

7.3 Recommendations for Application and Approval Requirements: Sites

(1) That a third category, Class 3 sites, be added to the regulation (Section 8.2.5) to allow for the control of mobile PCB chemical decontamination facilities that process

mineral oil with low levels of PCB concentrations in transformers in situ where the oil is to be reused in the transformer. The limit to the level of PCB concentration that the facility is allowed to process should be set at the testing and approval stages. The facility may be allowed to process the oil from energized transformers if it can be demonstrated at the testing and approval stages that such processing can be safely conducted. The voltage limit should be specified by the Director as a condition of approval.

(2) That the period for public notice and comment for Class 1 facilities be extended to 60 days.

(3) That a liaison committee be established to review a proposed Class 1 site and to make recommendations to the Ministry. The liaison committee should be composed of one representative each of the local municipality, the regional municipality, if legislation has assigned the responsibility for waste management to that level of government, the proponent and the Ministry of the Environment.

(4) That written notice for a Class 1 site be given not only to the local municipal Clerk and the Medical Officer of Health but also to the regional municipal Clerk, where appropriate; to landowners or tenants of lands adjacent to the proposed site and such others as the Director may specify; the local Director of Education and, if the site is part of an industrial establishment, to all workers associated with that workplace, according to the provisions of the Occupational Health and Safety Act (Sec. 29(5)), by posting a notice in the workplace.

(5) That, at the time of giving notice, a public repository be established to hold all documents associated with the application for approval of a Class 1 site.

(6) That the proposed requirements for the content of the notice for a Class 1 site be expanded to include a description of the composition of the PCB waste, i.e. whether it is of high or low level concentration, the schedule of operations and the location of the public repository for documents.

(7) That the requirements of the Ministry's proposal for notice for Class 2 sites be the requirement for notice for both Class 2 and Class 3 sites.

(8) That public notification requirements be embodied in the regulation.

(9) That the Ministry's proposal be amended in the appropriate sections to ensure that regional municipal governments, that have been given the responsibility for waste management, are informed and involved in the approvals process for these facilities.

(10) That the separation distance (Section 8.2.8.19) from Class 1 facilities, including associated equipment and PCB storage containers, to sensitive receptors be at least 250 metres but that the separation distances (Section 8.2.8.20) to sensitive receptors from Class 2 facilities, including associated equipment and PCB storage containers, be implemented as proposed.

(11) That there be no requirements for separation distances from sensitive receptors for Class 3 facilities.

(12) That the list of sensitive receptors as they are now incorporated in the regulation be expanded to include farm buildings, feedlots, and livestock feed processing or handling establishments.

(13) That the regulation (Section 8.2.8.23) be amended to require that all Class 1 and Class 2 facilities and associated equipment, including PCB storage containers, be located at least 100 metres from any watercourse. These destruction facilities should be isolated from openings to storm or sanitary sewer systems by the placement of temporary, impermeable impoundments or barriers. The required separation distance should not apply to Class 3 facilities if the Director is convinced that such a facility can be physically isolated from a watercourse as well as from sewer systems.

(14) That the requirement (Section 8.2.9.(1)) for a contingency plan to deal with emergencies, to be filed with any application for approval, be amended by adding a requirement that the contingency plan include a reporting protocol for notifying the Ministry of emergencies. That protocol should include noti-

fication to the Ministry of the occurrences forthwith, as immediate as circumstances allow.

(15) That the requirement to circulate the contingency plan (Section 10.2.2) to various local officials be amended to include the Clerk of the regional municipality where appropriate. This requirement for circulation of the contingency plan should be included in the regulation.

(16) That the requirement (Section 8.2.10(1)), for every applicant, other than a municipality, for a certificate of approval for a waste disposal site under this requlation, to post money, a surety bond or personal sureties in the amount of $50,000 be clarified to indicate that the $50,000 figure is a minimum amount and that the Director, under the Environmental Protection Act, has the discretion to increase this amount. This requirement, as amended, should apply to Class 1 sites only.

(17) That every applicant, other than a municipality, for a certificate of approval for a Class 2 or Class 3 mobile PCB destruction

money, a surety bond or personal sureties in the amount of $50,000, or such higher amount as the Director may specify, for each mobile PCB destruction facility that the applicant has in operation in the Province.

(18) That the proposed regulation (Section 8.9.10) include a provision that every applicant for a certificate of approval for a mobile PCB destruction facility waste disposal site shall provide proof of insurance or other funds adequate, in the judgment of the Director, to provide compensation or redress for bodily injury and for property and environmental damage.

(19) That the regulation be amended to prohibit the transportation of PCB wastes into the Province of Ontario for the purpose of destroying such wastes in mobile PCB destruction facilities.

7.4 Recommendations for Standards for the Operation and for the Maintenance of Sites

(1) That the proposed regulation (Sections 8.2.6 and 8.2.7) for the duration and frequency of operations of Class 1 and Class 2 sites be implemented as proposed and that the duration

of operations of Class 3 facilities be limited to 7 days (168 hours) at any one site with the provision that such time may be extended with the prior approval of the Director and the local municipality. There should be no limitation to the frequency of siting of Class 3 facilities in a local municipality.

(2) That the approval of the regional municipality be required for any extension of allowable operating durations for all classes of facilities and for more frequent siting of Class 1 and Class 2 facilities, if the regional government has been given responsibility for waste disposal in the municipality where the site is located.

(3) That the existing air quality guidelines for PCBs, PCDDs and PCDFs be incorporated in the regulation as proposed by the Ministry of the Environment and that the air quality guidelines for PCDDs and PCDFs be taken as the air quality guidelines for occupational health until guidelines for these substances have been developed by the Ministry of Labour for its use.

(4) That the proposed regulation (Section 8.2.8.6 (iii)) be amended so as to prevent the discharge of any wastewater containing detectable chlorinated dizenzofurans or chlorinated dibenzodioxins into receiving waters.

(5) That the proposed regulation (Section 8.2.8.4 and 8.2.8.6) be amended by adding statements that would prohibit the dilution of solid wastes or liquid effluents in order to meet the Minstry's standards for these substances.

(6) That the proposed regulation (Section 8.2.8.10) be amended to allow the Director to approve a reduction in the requirement for 100% containment capacity for stored wastes in response to a written application containing reasonable and safe alternatives for reducing this requirement.

(7) That the proposed regulation (Section 8.2.8.10) be amended to include a requirement for the installation of temporary facilities to exclude precipitation from spill containment areas or, in the alternative, the provision for methods for collecting and treating contaminated precipitation.

(8) That the provision (Section 10.5(a)) for controlling the volume of waste stored at each destruction site be included in the regulation and that it be amended to allow the Director, in response to a written application containing reasonable and safe provisions for contingency planning and containment capabilities, to allow additional storage on site.

(9) That the proposed regulation (Section 8.2.8.16) be amended to exempt Class 3 sites from the requirements for enclosure of the site.

(10) That the proposed regulation be amended to incorporate the requirements for pre-operational, operational and post-operational monitoring of these facilities and sites.

(11) That the proposed regulation be amended to require source air emission sampling and analysis, for Class 1 facilities, during the first 24 hours of operation at each site, after any major repairs to the facility and at least once more during the operational period at that site. This source emission monitoring regime should continue for the

first 3 site operations and, subsequently, at least once a year on a random basis. The levels of acceptable emissions should be established during demonstration testing and must meet the D.E. efficiency standard of 99.9999% with a mass air emission of PCBs of no greater than 0.001g PCB/kg of PCB introduced into the facility.

(12) That the requirements for continuous process monitoring (Section 9.5.1) be made part of the regulation and include, in addition to the parameters already alluded to, a requirement for input feed analysis for all classes of facilities.

(13) That the requirement for monitoring of aqueous effluents and solid wastes (Section 10.3.3(ii) and (iii)) be amended to include a requirement that all aqueous effluents be sampled and analyzed for PCBs, PCDDs and PCDFs before discharge. These requirements for monitoring of aqueous effluents and solid wastes should be included in the regulation.

(14) That the mineral oil in transformers that have been treated in situ by Class 3 facilities be sampled and analyzed for PCB content

90 days after the decontamination process has occurred and if found to be below 50 ppm PCB, the oil may be declassified as a PCB substance.

(15) That the operator of a mobile PCB destruction facility be required, in addition to other requirements stipulated in the regulation (Section 8.2.4) regarding record keeping, to include in his records the name of the owner of the PCB waste disposal site and a record of every accident, process upset, breakdown or spill that occurs at the site. The operator should also be required to retain all records for at least 5 years after the submission of his written report to the Ministry, which is required within 60 days after cessation of operations at the site.

7.5 Recommendations Regarding the Ministry's Role

(1) That the Ministry of the Environment develop a guidance manual to provide for a detailed and systematic approach for reviewing the applications for approval.

(2) That the provision for ambient air monitoring (Section 10.3.3(i)) be reduced at the Ministry's discretion to a level that will

ensure detection of any fugitive emissions from the destruction facilities and that will reassure the public that the air quality is not being adversely affected.

(3) That a trained Ministry of the Environment inspector be present at a site at all times of operations of Class 1 facilities.

(4) That the proposed inspection regime (Section 10.3.2) apply to Class 2 and Class 3 facilities and that such inspections occur on a random basis and include evening and night-time inspections if facilities are operating 24 hours a day.

(5) That a properly trained Ministry inspector examine the completed installation of a Class 1 facility at each site before start-up of operations to ensure that any needed remedial or repair actions are performed.

(6) That the Ministry report the results of environmental monitoring analyses to the public within three months of the cessation of operations of facilities at any site (Section 10.3.4).

(7) That the Ministry ensure that the proposed regulation for mobile PCB waste disposal facilities be written in such a fashion as to preclude the triggering of a hearing under the Environmental Protection Act. The pre-existing licensing of the site should not otherwise be interfered with.

(8) That the Ministry keep a central registry of sites that have been used for mobile PCB destruction facility waste disposal sites.

7.6 Recommendation for Air Quality Guidelines for Occupational Health and Safety

(1) That the Ministry of Labour be urged to designate PCBs, dioxins and furans as substances to be regulated under the Occupational Health and Safety Act and that standards for air quality guidelines be established for these substances in the work-place.

7.7 Recommendation for Incentives for the Destruction of PCBs

(1) That the Ministry of the Environment together with Environment Canada consider incentives for removing PCB materials from the environment, such as the prohibition of the storage

of PCBs substances for more than one year after removal from service and the legislation of a gradual phasing out of transformers and other equipment containing PCB mixtures, when suitable PCB destruction facilities are available.

8.0 APPENDICES

Ontario

8.1 Guide to Hearings

The Commission On The Regulatory Control
Of Mobile PCB Destruction Facilities

Commission de surveillance et de réglementation des
installations mobiles de destruction des PCB

1 St. Clair Ave. West
5th Floor
Toronto, Ontario
M4V 1K6
416/965-2531

1 ouest, avenue St. Clair
5e étage
Toronto (Ontario)
M4V 1K6
416/965-2531

COMMISSION OF INQUIRY ON THE REGULATORY CONTROL OF MOBILE PCB DESTRUCTION FACILITIES

GUIDE TO HEARINGS

PART A - INTRODUCTION

A Commission has been established by Order in Council No. 1772/84 to hold a public hearing on the regulatory and administrative program proposed by the Ministry of the Environment for the establishment and operation of mobile PCB destruction facilities on temporary sites in Ontario and to make recommendations to the Minister of the Environment regarding these matters. The Rules of Procedure in Part C are established to assist the Commission in its information-gathering function without imposing unnecessary formalities or restraints on interested parties. All parties will be expected to comply with these rules and with the spirit of co-operation in the public interest that these rules are designed to foster in assisting the Commission in its mandate.

PART B - SCHEDULE OF HEARINGS

1. The public hearings will commence with 9 preliminary hearings at the following places and dates:

September 10, 1984:	Thunder Bay	11:00 a.m.
September 11, 1984:	Sault Ste. Marie	10:00 a.m.
September 12, 1984:	Sudbury	9:00 a.m.
September 14, 1984:	Ottawa	9:00 a.m.
September 17, 1984:	Toronto	10:00 a.m.
September 18, 1984:	Hamilton	10:00 a.m.
September 19, 1984:	Windsor	10:00 a.m.
September 20, 1984:	London	10:00 a.m.
September 21, 1984:	Peterborough	10:00 a.m.

2. The Commission will not hear evidence at these preliminary hearings. Their purposes are as follows:
   - (a) introduction of Commission and statement of purpose;
   - (b) identification and registration of interested parties;
   - (c) to the extent possible, an indication whether a party intends to participate on a full-time or a part-time basis;
   - (d) identification of issues of concern, where possible;
   - (e) distribution of the Ministry of the Environment's proposal and supporting information;
   - (f) distribution of applications and criteria for funding.

3. The hearing will adjourn on September 21 until November 5, 1984 when it will recommence in Toronto and continue from day

to day, as determined by the Commission. The purposes of this phase of the hearing will include:

(a) further identification of parties and issues as necessary;

(b) resolution of any outstanding procedural matters;

(c) presentation of the proposed regulatory and administrative program by the Ministry of the Environment;

(d) presentations by any other full-time and part-time parties who may wish to make presentations to the Commission in Toronto.

4. The Commission will hold further hearings throughout Ontario at locations and times to be determined for the purpose of hearing any full-time or part-time parties who may wish to make presentations to the Commission in locations other than Toronto. Public notice will be given of these locations and times when available.

PART C - RULES OF PROCEDURE

1. An interested party may register as either a full-time or as a part-time party to the Inquiry. Any party, full-time or part-time, may call and examine witnesses individually or in panels and may conduct such cross-examination of witnesses as is reasonably required for a full and fair disclosure of the facts concerning which they have given evidence.

2. Part-time party status is appropriate for any persons or group of persons who wish to present their views to the Commission

but who do not intend to take an active role throughout a substantial portion of the Inquiry.

3. Full-time party status is appropriate for those parties who intend to participate actively throughout all or a substantial part of the Inquiry. The Ministry of the Environment, as proponent, is designated as a full-time party.

4. A party is encouraged to register as a full-time party or as a part-time party at any one of the 9 preliminary hearing days or by registered mail to the Commission Registrar, but may register during the continuation of the hearings. A full-time party will receive a copy of the Ministry of the Environment's proposal and the detailed supporting information which will form the basis for the Ministry's evidence. A part-time party will receive a copy of the Ministry of the Environment's proposal and will receive a copy of the detailed supporting information only if specifically requested.

5. Full-time parties are encouraged to present their evidence in Toronto, following the conclusion of the Ministry of the Environment's evidence, except where the evidence is primarily specific to a particular part of the province. In such cases, the party is requested to call that evidence at the hearing location closest to the particular area. Any full-time party which may prefer to present its evidence at a location outside of Toronto is requested to make that preference known at one of the preliminary hearings.

6. Part-time parties are encouraged to present their evidence to the Commission at the location which is most convenient to them. Part-time parties wishing to make a presentation to the Commission in Toronto will be given an opportunity to do so immediately following the presentations made by full-time parties in Toronto.

7. A party may seek leave of the Commission to change its status to or from full-time or part-time at any time.

8. The full-time parties are strongly encouraged to meet together during the period between September 21, 1984 and the recommencement of the hearings on November 5, 1984 at 10:00 a.m. for the following purposes:
   (a) to define issues;
   (b) to obtain mutual agreement about undisputed facts;
   (c) to attempt to resolve any procedural matters in dispute;
   (d) to co-ordinate efforts with parties sharing similar concerns or positions;
   (e) to exchange documents;
   (f) to estimate the length of their presentations and cross-examinations;
   (g) to take any other steps as may facilitate the procedures and assist in the presentation of evidence to the Commission.

9. The Commission will accept written submissions from persons not wishing to appear before the Commission. However, such

persons are strongly encouraged to attend before the Commission, if possible, to answer any questions from the Commission or other parties to assist the Commission in its consideration of the submission. Written submissions received by the Commission will be available to other parties. The Commission will not consider any written submission received after the close of the public hearings.

10. Any full-time party intending to call an expert witness who will express technical opinions regarding the subject matter of the Inquiry shall provide a copy of the witness' curriculum vitae and a full but concise summary of the witness' evidence to all full-time parties, and to any part-time party who requests it, at least 7 full calendar days before the witness testifies. Any part-time party intending to call any such witness is strongly encouraged to comply with these same requirements.

11. Any party intending to use, in cross-examination, a document not already in evidence shall give notice of its intention to do so to the party whose witness is being cross-examined. This notice should be given long enough beforehand to let the witness familiarize himself with the document and sufficient copies of any such documents shall be provided for the Commission and for other parties present.

12. The Commission has the power to issue a summons to compel the attendance of a witness.

13. The Commission may amend these rules from time to time, and may suspend or limit their application, in whole or in part, either orally or in writing.

PART D - APPLICATIONS & CRITERIA FOR FUNDING

1. The Commission is empowered to administer a fund, not to exceed $50,000.00, to assist parties in defraying their reasonable costs of participation in the inquiry related to typing, printing, photocopying, transcripts, and counsel and expert witness fees. Assistance for travel, food and accommodation may also be provided within the limits of the Ministry of the Environment's Guidelines.

2. Funding will be allocated to parties in accordance with the following criteria:
   - (a) whether there is a clear ascertainable interest to be represented and a specific purpose for the assistance;
   - (b) whether a separate and adequate representation of a particular interest would assist and substantially contribute to the hearing;
   - (c) whether there is a need, and whether the party has tried to raise funds through other means;
   - (d) whether there is demonstrated a delineated purpose for the expenditure of funds;
   - (e) whether there has been a co-ordinated effort to bring a number of interests within one representative group;

(f) whether the particular interest has established a record of concern and a demonstrated commitment in a responsible way to that concern;

(g) how the party intends to account for the funds.

3. Funding will be allocated by the Commission on the basis of the above criteria and on the basis of attempting to obtain the greatest assistance in its information-gathering function for the money allocated to an applicant.

4. Applications for funding may be obtained on one of the preliminary hearing days or by mail from the Commission Registrar. Applications must be returned to the Commission Registrar on or before October 1, 1984. Applications will be considered and funding allocated to applicants by October 12, 1984. Late applications will be considered but may not be funded if the fund is exhausted by applications received on or before October 1, 1984.

5. An application for funding must be in the form available from the Commission Registrar and must contain a budget for the applicant's participation in the hearing showing the amounts projected for the items listed in item 1 above, for which funding may be available.

6. Allocated funds will be distributed to eligible parties on the following basis:

(a) 50% of the amount will be provided to the party within one week of October 12, 1984;

(b) 50% of the funding will be provided to the party at the conclusion of the party's involvement in the Inquiry and upon the submission of a report, satisfactory to the Commission, documenting the following items:

(i) what contribution the party was able to make to the Inquiry as a result of the funding received;

(ii) an affidavit from the party or its designated representative documenting when and how the funds received have been spent and what expenses remain to be reimbursed by the funds not yet received, accompanied by all pertinent receipts, invoices and accounts paid or to be paid;

(iii) a comparison of the party's actual expenditures with its budget.

Ontario

The Commission On The Regulatory Control
Of Mobile PCB Destruction Facilities

Commission de surveillance et de réglementation des
installations mobiles de destruction des PCB

1 St. Clair Ave. West
5th Floor
Toronto, Ontario
M4V 1K6
416/965-2531

1 ouest, avenue St. Clair
5e étage
Toronto (Ontario)
M4V 1K6
416/965-2531

COMMISSION OF INQUIRY ON THE REGULATORY CONTROL OF MOBILE PCB DESTRUCTION FACILITIES

APPLICATION FOR FUNDING

Please refer to the Funding Criteria contained with the Guide for Hearings.

Please attach further pages as necessary.

Applications must be submitted by October 1, 1984 to the Commission Registrar at the above address.

==

1. Name of Individual or Organization:

2. Address:

3. Telephone Number:

4. If an umbrella organization, please list all member groups and identify a contact person for each group and their addresses and telephone numbers.

5. If an organization or group, please identify the person who is to receive the funding on behalf of the organization or group and who will be responsible for submission of the final report to the Commission in accordance with item 6 of the Criteria for Funding.

6. Reasons for requesting funding. Please explain how you or your organization satisfy the funding criteria set out by the Commission.

7. Please attach a budget for your participation in the hearing showing the amounts projected to be needed for the items listed for which funding may be available. Please be as specific as possible.

8. If your budget includes amounts projected for expert witness fees, please identify the name and/or the expertise of the witness you would like funding for, if possible. Please indicate why you believe that this evidence would be of assistance to the Commission in its mandate, if possible.

8.3 Public Participation

Municipalities, organized groups, interested parties and the general public were afforded opportunities to participate in the formulation stages of the proposal prior to the hearings and were invited and encouraged to take part in the hearings themselves.

In May of 1983, the MOE circulated for comment, 650 copies of a report entitled "Guidelines for the Regulation and Siting of Mobile PCB Destruction Facilities - A Discussion Paper." The report was distributed to 180 municipalities reported as containing PCBs, 350 public utilities, a variety of associations and interest groups and to potential proponents. The essence of the report was the plan by the Ministry to facilitate the establishment of Mobile PCB destruction facilities.

There was a limited response to the report but the majority of those reporting was either supportive or neutral or raised issues that could be addressed.

In September 1983, a Task Force was formed to develop the regulatory proposal and to implement a public consultation plan. The Task Force met with regional and local municipal staff in 20 communities and also with representatives of several industries and utilities, with public interest groups and with representatives of organized labour. As a result, there were substantial revisions made to the report. These were incorporated in

8.3 Public Participation (cont'd.)

the revised proposals and draft regulation (Exhibits 52, 53, 54, 55).

The Task Force also organized public sessions held in those communities with the greatest concentration of in-service and stored PCBs. There were some 19 such communities. Sessions were conducted as informal "open houses" and were advertised three times in the daily newspapers and once in the weekly newspapers of the municipalities and the surrounding areas. At these sessions, besides oral explanations, pertinent written material was distributed as well as the proposal itself. Record forms were available for any attendees wishing to submit written comments or ask for more detailed information and about 10 per cent of the approximately 455 attendees completed such forms.

The formal hearing was scheduled to commence in Toronto on November 5, 1984. Notice of the hearing was mailed to all persons identified in Schedule "A" to the Order in Council. As well, the notice was published in 60 newspapers across the Province, and in the case of larger newspapers, it was published two times or even three times. The Notice announced the holding of preliminary hearings in nine cities prior to the commencement of the formal hearings when presentations would be received. Those cities are Thunder Bay, Sault

8.3 Public Participation (cont'd.)

Ste. Marie, Sudbury, Ottawa, Toronto, Hamilton, Windsor, London and Peterborough. The preliminary hearings served to identify parties, issues and future hearing locations as well as to deal with funding arrangements and other procedural matters.

The notice also announced the availability of funding for persons or organizations which required assistance and which met specific criteria. Included in the notice was a cut-out to be filled in by prospective participants which would indicate their degree of participation, e.g. part-time, full-time, only on the day of their own presentation and whether the presentation would be written as opposed to oral. A person might even indicate his non-participation but could request a copy of the Commission's report after publication. In addition to publication in the 60 newspapers, the notice was delivered to Canada News Wire for publication in weekly newspapers throughout the Province.

Most of the public hearings were conducted in Toronto, but as a result of what the Commission heard at the preliminary hearings, it scheduled public hearings to receive evidence in Peterborough and Chatham and held an evening session in each of these cities. Because of a newspaper strike prior to the holding of the preliminary hearing in Sudbury, and even though there were parties

8.3 Public Participation (cont'd.)

who attended that hearing, it was decided to hold a public hearing in that city as well. The hearings in the three cities took place in the early part of January and thereafter, the hearings resumed in Toronto. Notices for these out-of-town hearings were published in the local daily newspapers and in six other daily newspapers as well so that people in other locations who might wish to make representation would have notice. The notice was also published in the Toronto Star.

The Commission held all day-time Toronto sessions (except for the Toronto preliminary hearing) at the Boardroom of the Environmental Assessment Board, 1 St. Clair West. It held two evening sessions at Bloor Collegiate Institute in order to accommodate residents of the Junction Triangle, an area with serious environmentally related concerns.

In all, ten participants requested and received full-time party status. There were some 75 part-time parties who made presentations and among these, there were some who took a very active part in terms of attending the sessions and in cross-examination. It should noted that every party whether full-time or part-time, was invited to exercise the right of cross-examination.

8.3 Public Participation (cont'd.)

Finally, there were those individuals or organizations the majority of which did not participate at the hearings themselves, but submitted written briefs and these were received by the Commission as evidence. In all, there were thirty such briefs.

The hearings were conducted in an atmosphere of cooperation between the Board and the parties and among the parties themselves. The Board had ordered that witness statements be served and filed in advance of expert and technical witnesses adducing their evidence. This had the effect of avoiding delays that might otherwise have occured as a result of parties requesting adjournments in order to consider complicated technical matters. The Commission was able to furnish some help in the form of xeroxing, secretarial and telephone services and these services enabled counsel and others to go about their business during recess periods without interrupting the regular flow of the hearings.

The Commission expresses its satisfaction with the comprehensive nature of the hearings and the high quality of the presentations made by the parties. The Commission wishes to thank all those who participated whether to a larger or lesser degree, and expresses its hope that the hearings mark a significant point in the understanding of a complex problem and its resolution.

8.4 Report on Funding

by S.R. Garrod, Commission Counsel

Introduction

Order in Council No. 1772/84 which established the Commission also established a fund, not to exceed $50,000, to assist parties in defraying their reasonable costs of participation in the inquiry. Subsections 5(1), (2) and (3) specified the categories of costs which were eligible, suggested certain criteria for granting payment to a party and provided that the Commission was to exercise its discretion with respect to further criteria and procedures for the administration of the fund.

The Commission established criteria for funding and procedures for applications to the fund which were published as Part D of the Guide to Hearings on August 23, 1984. (See Appendix 8.1).

Those criteria incorporated the criteria suggested by the Order in Council and included the criterion that the Commission would allocate funding "...on the basis of attempting to obtain the greatest assistance in its information-gathering function for the money allocated to an applicant." The eligible categories of costs and the full list of criteria are contained in items 1, 2 and 3 of Part D of the Guide to Hearings. Application forms were designed to reflect the procedures and criteria and were distributed on request. (See Appendix 8.2).

8.4 Report on Funding (cont'd.)

The Commission solicited applications to the fund in several ways: copies of the Guide to Hearings were sent to all persons on the Commission's mailing list; explanations of the funding provisions were made by Commission Counsel at each of the nine preliminary hearings held between September 10 and September 31, 1984 in centres across the province; notices of the preliminary hearings which were widely published, as required by the Order in Council, made reference to the availability of funding and included a coupon to be returned by an interested party; and all participants in the pre-hearing consultation process were advised of the funding provisions.

The Applications

Funding applications were due on October 1, 1984 and the Commission met to consider applications on October 3, 1984. Applications were initially received from 15 parties requesting a total of $98,540.00 (One application did not specify an amount.) In addition, a notice of intention to submit an application was received from the Canadian Environmental Law Assocation (CELA) on behalf of the Inverhuron District Ratepayers Association (IDRA).

On October 9, 1984, the Commission received a joint application from CELA on behalf of the Northern Health

Area Community Advisory Board (NHA CAB) and IDRA as a result of those groups agreeing that their concerns were similar in nature and could be represented by CELA.

Two months later, after a public hearing by the Commission in the Bloor Collegiate Institute in Toronto on December 11, 1984, 8 citizens' groups with concerns about the destruction of PCBs in the Junction Triangle area of Toronto, formed the Parkdale Residents' Committees' Coalition and applied to the Commission for funding to have a researcher review the proposal and present the Coalition's concerns to the Commission.

Applying the Criteria

Applications were evaluated according to the criteria with initial screening being done on the basis of need. Since the total of all applications exceeded the maximum amount of the fund by approximately a factor of two, it was determined that applicants which had access to alternative sources of funds would be given lower priority. On this basis, the two municipalities which applied were rejected as was the Ontario Municipal Electric Association.

Secondly, applications were evaluated on the benefit that would result to the Commission from the proposed participation of the applicant. Seven applicants were considered to offer significantly less potential for a valuable contribution than the others, on the basis of the information provided with the applications. These were rejected on that basis.

Funding was granted initially to the Pollution Probe Foundation and to the Industrial Research Institute of the University of Windsor. Applicants that were rejected by the earlier screening process were encouraged to attempt to coordinate efforts with one of the funded groups.

Finally, it was considered that certain applicants, while potentially valuable in the contribution that they could make, overlapped in their concerns to the extent that the Commission considered it desirable to attempt to encourage the formation of coalitions of parties with similar interests. Consequently, the Commission deferred consideration of applications by the Environmental Health Committee of the Northern Health Area Community Advisory Board, (NHA CAB), the London Occupational Safety and Health Group (LOSH) and the Citizen's Coalition to Maintain the Environment (CCME).

The NHA CAB decided to be represented by CELA and were included in CELA's application of October 9, 1984, as noted above. The Commission reviewed the application

8.4 Report on Funding (cont'd.)

and was satisfied that it met the criteria, particularly since effort had been made to avoid duplication of expert witnesses that other groups were proposing to present and since two groups with similar interests had been brought together.

This latter criterion was also satisfied by the application submitted on behalf of the Parkdale Residents' Committees' Coalition for funding to bring expert evidence forward to present their concerns. Eight different groups combined to hire a researcher to testify on behalf of all of them. The Commission was satisfied that the criteria were met and funded the application.

Several opportunities were provided by the Commission to LOSH and CCME to formulate a joint application which would more closely meet the Commissions' criteria. Unfortunately, after some negotiation between the groups they decided to resubmit individual applications which were evaluated accordingly. Following the communication of the allocation to CCME, the group declined the offer of funding and withdrew from the inquiry since it did not consider that it was able to make a worthwhile contribution with the amount it was awarded.

8.4 Report on Funding (cont'd.)

Priority was given to funding items which would provide maximum value to the Commission in fulfilling its mandate. Consequently, fees for expert witnesses were rated more highly than were legal fees or administrative costs. Expert witnesses were funded only insofar as they did not unnecessarily duplicate efforts of other funded parties.

Legal fees were granted only to LOSH and originally to CCME before their withdrawal. Because the mandate of the Commission was essentially an information gathering one, the Commission structured its rules of procedure and the hearings in a way that was designed to be as informal as possible. Consequently, legal input was considered by the Commission to have less value than expert evidence and was funded only where necessary to ensure the participation of a group which would otherwise be unable to participate meaningfully. The essentially non-adversarial nature of these proceedings made this approach possible and minimized the need for lawyers.

Costs associated with administrative overhead were not funded initially. All funded parties were informed that the Commission was retaining a small reserve fund which would be available, upon application, for assistance towards those and other legitimate expenses at the end of the hearing.

8.4 Report on Funding (cont'd.)

Supplementary Applications

Supplementary applications were received from two of the funded parties during the course of the hearings. The London Occupational Safety and Health Group was granted an additional $2,000.00 for legal fees based on their submissions that the hearings had extended considerably beyond what had originally been anticipated. The Commission evaluated the request and granted it, subject to the understanding and condition that at least $500.00 of the money earlier granted to LOSH for coordinating public participation in the London area was going to be refunded to the Commission since it was not needed by LOSH for that purpose. In fact, $800.00 was recredited to the Commission from this category by LOSH in its final accounting of March 20, 1985.

A supplementary application was also received by CELA on behalf of its two clients for a further $1,900.00 which was necessary to cover disbursements associated with retaining certain expert witnesses. These disbursements had not been originally anticipated by CELA but were considered justified in light of circumstances which forced CELA to retain experts other than those originally anticipated. The Commission therefore granted this request.

8.4 Report on Funding (cont'd.)

Ensuring Accountability

The Commission's criteria for funding applicants included the criterion of "(g) how the party intends to account for the funds". Parties were required by item 5 of Part D of the Guide to Hearings to submit a budget as part of their applications and these budgets were carefully evaluated by the Commission before funding was granted.

Accountability was ensured by withholding 50% of any money allocated to a party until the requirements of item 6 of Part D of the Guide to Hearings had been complied with. That item required each funded party to submit a report to the Commission at the end of its involvement in the Inquiry outlining the contribution that the party had been able to make to the inquiry as a result of the funding provided and documenting how its expenditures had been made in comparison with its budget.

Funds were allocated to a party for particular purposes as outlined in the proposed budget submitted with the application. Parties were authorized to exercise discretion within a category as to how the money would be spent but were not able to transfer funds between categories without authorization. Consequently, for example, a party which was funded $2,000.00 for each of two specific expert witnesses could decide to pay one

8.4 Report on Funding (cont'd.)

of them $3,000.00 and one $1,000.00 if it considered that that was of greater value to the Commission. It would not, however, be entitled to spend the money for legal fees or administrative costs.

All funded parties complied with the accountability requirements and the Commission made adjustments to the allocations where it considered that the original allocations were not needed in the end result or where additional allocations were needed and justified.

The Industrial Research Institute had their allocation revised from $4,500.00 to $3,714.65 on the basis that not all of the funds granted for eligible expenses were spent. Additional expenses, not originally funded, were incurred by the Institute, However, funding was not extended to cover those items since the Commission considered that the contribution of the Institute did not warrant additional funding.

The allocation granted to LOSH was also reduced following that group's final submission on funding. A total of $7,500.00 had been allocated to LOSH as a result of two separate applications. In the result, LOSH did not require $800.00 of the $1,000.00 originally allocated for coordination of public participation and this was recredited to the Commission. The second allocation of

8.4 Report on Funding (cont'd.)

$2,000.00 to LOSH for legal fees had been made conditional on the fact that at least $500.00 from this earlier category was not needed. In addition, the final allocation to LOSH was reduced by $200.00 on the basis that members of LOSH had not been called to testify regarding occupational health concerns as contemplated by the original funding application and that no explanation of this was provided to the Commission. As a result of these reductions LOSH received a total of $6,500.00 rather than $7,500.00 as originally allocated.

Adjustments were also made to the allocation made to the Parkdale Residents' Committees' Coalition in order to bring their claim for mileage expenses within the guidelines established by the provincial government. Their allocation was accordingly reduced by $50.00 to $2,450.00.

Two groups had their allocations increased as a result of supplementary applications which accompanied their final submissions on costs. The Pollution Probe Foundation which had originally been granted $15,500.00 applied for and received an additional $5,501.25 primarily related to expenses associated with having its representative participate throughout the hearings on a daily basis. The Commission considered that the

8.4 Report on Funding (cont'd.)

Foundation, through its representative, had made a very substantial contribution throughout the hearing and considered the further request entirely justified.

The Canadian Environmental Law Association also applied for and received additional funds. CELA had been allotted a total of $14,400.00 as a result of its two earlier applications. Its final funding report requested permission to use funds originally earmarked for a toxicologist who was not called as a witness to make up a deficiency incurred as a result of higher invoices from other witnesses. This permission was granted on the basis that a valid explanation was provided to the Commission at the time that the toxicologist was not called as a witness and the Commission felt that the reallocation was appropriate. In addition, CELA requested additional funding to cover disbursements associated with telephone calls, photocopying, delivery, transportation and miscellaneous expenses totalling $778.82 beyond what had been earlier allocated in this category and this was granted. The Commission considered that IDRA and the NHA CAB, through its counsel from CELA, had played a very important role in the inquiry and had contributed substantially to the process.

8.4 Report on Funding (cont'd.)

Evaluation

The allocation of funding to parties substantially assisted the Commission in the carrying out of its mandate. A total of $49,844.72 was distributed among 5 parties. Schedule A summarizes the final allocations to each party. All of the funded parties contributed to some degree to the process and to a fuller exploration of issues of concern to them. However, the contributions of two of the parties were particularly significant.

The Pollution Probe Foundation and CELA (on behalf of two groups) received a total of $37,180.07 or 74% of the total amount allocated. These expenditures were an unqualified success. Both groups actively participated on a full time basis and provided the inquiry with valuable direct evidence, through the witnesses funded by the Commission, and with extremely effective questioning of other parties' witnesses. Many important issues were raised and addressed as a result of the work of these two groups and the Commission considers that the inquiry could not have been successfully conducted without their input.

Although the Industrial Research Institute focussed their concerns on the important issues of monitoring and instrumentation and perhaps therefore encouraged the Ministry of the Environment and other parties to address

8.4 Report on Funding (cont'd.)

these issues in greater depth than they otherwise might have, the evidence of the Institute itself was not particularly helpful to the Commission. Because they were only involved on a part-time basis, the representatives of the Institute were not always present when relevant evidence was presented by others and this appeared to limit the relevance of some of their evidence. In addition, evidence on water sampling and analysis, which had been contemplated and funded, was not presented. No explanation was given for this change of plans and accordingly the group's funding allocation was reduced as outlined above.

Similarly, although LOSH was concerned primarily with occupational health and safety issues, the group did little to either raise or explore these subjects. Their expert evidence was limited to the issue of the transportation of dangerous goods and no evidence was presented from members of LOSH as to the nature of their concerns.

The Parkdale Residents' Committees' Coalition retained a researcher who reviewed the MOE proposals and testified regarding his concerns with the proposal. Much of his evidence was beyond his expertise and therefore superficial in relation to what the Commission had heard from other experts. In addition, no members of the

8.4 Report on Funding (cont'd.)

Coalition, who had earlier expressed such concern about aspects of the proposals, attended the hearing when their researcher testified and was cross-examined.

The Commission concluded that while the funding exercise was overall a major success, greater emphasis could have been placed on criterion (f) in item 2 of Part D of the Guide to Hearings. That is, "whether the particular interest has established a record of concern and a demonstrated commitment in a responsible way to that concern." Although efforts were made by the Commission to gain further information about all of the groups funded and it was satisfied that all were sufficiently responsible to justify the awarding of funds, it is not likely a coincidence that the most substantial contributions were made by public interest groups wich have a long standing commitment to environmental issues and have a familiarity with the hearing process that enables them to function effectively in that context.

The situation may well be different in a hearing of a different type, where a site specific proposal may necessitate the formation of an ad hoc citizen's group. However, where proposals with province-wide implications which are not site-specific in nature are the subject of an inquiry, it seems evident that public interest groups with demonstrated track records are more likely to be able to make a substantial contribution to the process than others.

SCHEDULE A

Party	Amount of Funding granted by the Commission
The Canadian Environmental Law Association	$16,178.82
The London Occupational Safety & Health Group	6,500.00
Parkdale Residents' Committees' Coalition	2,450.00
The Pollution Probe Foundation	21,001.25
The Industrial Research Institute of the University of Windsor	3,714.65
TOTAL	$49,844.72

8.5 Appearances

Stephen R. Garrod	-	Commission Counsel
John L. Martin	for	Ministry of the Environment
Eric Finn Arthur D. Gardner	for	Ontario Hydro
Steven Shrybman	for	Inverhuron District Ratepayers Association and The Environmental Health Committee for the Northern Health Area Community Advisory Board
Joanna Kidd	for	Pollution Probe Foundation
Raymond M. Feig	for	The Regional Municipality of Halton
Wilson Lee Rod Turnbull	for	The Regional Municipality of Peel
Robert Clayton	for	The Ontario Waste Management Corporation
Dr. Alex Gnyp Dr. Carl St. Pierre	for	Industrial Research Institute, University of Windsor
Peter Cassidy Vici Mummery	for	London Occupational Safety and Health Group (LOSH)
Edgar Whelan	for	Toronto Hydro
Lou Romano	for	The Association of Municipalities of Ontario and the Corporation of the City of Windsor
Richard Boehnke	for	The Department of Public Health, City of Toronto
Peter Lauwers	for	The Metropolitan Separate School Board
Amy Murabayashi	for	The Bloordale PCB Committee
Allan M. Schwartz Daphne Wagner	for	The Ontario Municipal Electric Association

8.5 Appearances (cont'd.)

Betti Orsatti	for	Dufferin/Lansdowne Residents Association and The Parkdale Residents' Committees' Coalition
Douglas L. Gates	for	The Corporation of the Town of Oakville
R. Kent Gillespie	for	The Corporation of the City of Mississauga

8.6 List of Witnesses

1. Mr. Richard A. Abbott
   Health Hazards Analyst
   Program Development Unit
   Occupational Health and Safety Branch
   Ontario Ministry of Labour

2. Dr. Carole D. Burnham
   PCB Task Force Leader
   Ontario Ministry of the Environment

3. Dr. Stephen Safe
   Professor, Veterinary Physiology and Pharmacology
   University of Guelph

4. Dr. Donald L. Grant
   Acting Head
   Toxology Research Division
   Health and Welfare Canada

5. Dr. Denis J. Corr
   Head, Hazardous Contaminants Research Planning
   Ontario Ministry of the Environment

6. Dr. Samuel N. Linzon
   Manager, Phytotoxicology Section
   Ontario Ministry of the Environment

7. Mr. John G. Ralston
   Manager, Aquatic Contaminants Section
   Water Resources Branch
   Ontario Ministry of the Environment

8. Mr. David L. Wells
   Toxicity Scientist
   Aquatic Contaminants Section
   Water Resources Branch
   Ontario Ministry of the Environment

9. Dr. Douglas H. Harding
   Medical Consultant
   Health Studies Service
   Special Studies and Services Branch
   Ontario Ministry of Labour

10. Mr. Robert Kusiak
    Biostatistician, Health Studies Service
    Ontario Ministry of Labour

11. Mr. Chester E. Duncan
    Manager, Emission Technology and Regulation Development Section
    Air Resources Branch
    Ontario Ministry of the Environment

8.6 List of Witnesses (cont'd.)

12. Mr. Louis Shenfeld
Manager, Air Quality and
Meteorology Section
Air Resources Branch
Ontario Ministry of the Environment

13. Mr. Edward W. Piche
Acting Director
Hazards Contaminants and
Standards Branch
Ontario Ministry of the Environment

14. Mr. R.M. Gotts
Director, Waste Management Branch
Ontario Ministry of the Environment

15. Mr. E.T. Oppelt
Chief, Incineration Research Branch
Industrial Environmental Research Laboratory
U.S. Environmental Protection Agency
Cincinnati, Ohio

16. Miss Jenny Carriero
Bloordale Committee Against PCB Burning
Toronto, Ontario

17. Ms. Julianne Lucas
Sorauren Avenue and Area PCB Committee
Toronto, Ontario

18. Mr. Jerry Chmielewski
Sorauren Avenue and Area PCB Committee
Toronto, Ontario

19. Miss Lina Deluca
Parkdale-Lansdowne PCB Committee
Toronto, Ontario

20. Mr. Tony Ruprecht, MPP-Parkdale
Toronto, Ontario

21. Mr. Mario Cardillo
St. Clair West PCB Action Committee
Toronto, Ontario

22. Miss Lucy McMahon
St. Clair West PCB Action Committee
Toronto, Ontario

23. Mr. Ernie Arduini
St. Clair West PCB Action Committee
Toronto, Ontario

24. Mr. Solomon Spencer
St. Clair West PCB Action Committee
Toronto, Ontario

8.6 List of Witnesses (cont'd.)

25. Miss Betty Orsatti
Dufferin/Lansdowne Residents' Association
Toronto, Ontario

26. Mr. Andrzej Kozlowicz
Davenport PCB Committee
Toronto, Ontario

27. Mr. Sean McGee
Davenport PCB Committee
Toronto, Ontario

28. Mr. Richard Gilbert
Alderman-Ward 3
Toronto, Ontario

29. Mr. Dale Ritch
Dovercourt Park Residents' Association
Toronto, Ontario

30. Mr. Andre Brazeau
Dovercourt Park Residents' Association
Toronto, Ontario

31. Mr. Nick Trainos
Toronto, Ontario

32. Mr. E. Kronlachner
Toronto, Ontario

33. Mr. Algis Geneitis
Toronto, Ontario

34. Mr. Tony Lupusella, MPP
Toronto, Ontario

35. Mr. Joe Palozzi
Toronto, Ontario

36. Mr. Terence McKibbin
Toronto, Ontario

37. Mr. Archie Wisman
Toronto, Ontario

38. Mr. Martin Schregenberger
Toronto, Ontario

39. Mr. Richard Watts
Regal Heights Residents' Association
Toronto, Ontario

40. Keri Reynolds
Toronto, Ontario

8.6 List of Witnesses (cont'd.)

41. Dr. David Balsillie
Director, Air Resources Branch
Ontario Ministry of the Environment

42. Ms. Helle Tosine
Manager, Drinking Water Organics
and Dioxin Laboratory
Ontario Ministry of the Environment

43. Mr. David J. Pascoe
Manager, Environmental Contaminants
Control Division
Environmental Protection Service
Ontario Region
Environment Canada

44. Mr. G. Wayne Scott
Ontario Ministry of the Environment

45. Mr. H.R. Butler
Ontario Mining Association

46. Mr. Ross Williams
Ontario Forest Industry Association
Spruce Falls Pulp and Paper

47. Mr. Patrick G. Morrow
Regional Engineer
Regional Municipality of Sudbury

48. Mr. J.G. Hooper
City Engineer
City of Peterborough

49. Mr. John H. Ball
Health & Safety Committee
Canadian General Electric Co. of Canada

50. Professor R.A. Stairs
Department of Chemistry
Trent University

51. Professor C.D. Metcalfe
Environmental & Resource Studies
Trent University

52. Mr. M.A. Reader
Township Council
Township of Otonobee

53. Mr. Simon Shields
Peterborough, Ontario

54. Mr. Vernon Salt
Peterborough, Ontario

8.6 List of Witnesses (cont'd.)

55. Mr. John J. Vlad
Peterborough, Ontario

56. Mr. Victor H. Norman
Warden - Peterborough County

57. Mr. Michael J. Brown
Peterborough, Ontario

58. Mr. J.A. Cholma
Environmental Control Engineer
City of London

59. Mr. Jan Poniecki
Sarnia, Ontario

60. Mr. Louis Romano
Director of Pollution Control
City of Windsor

61. Mr. James M. Meredith
Windsor, Ontario

62. Mr. Murray Berman
Alderman
City of Chatham

63. Mr. Ronald G. Denning
Lambton Industrial Society
Sarnia

64. Dr. P.K. Misra
Head, Atmospheric Model Development Unit
Air Quality & Meteorology Section
Air Resources Branch
Ontario Ministry of the Environment

65. Mr. J.S. Hartill
Manager - Transmissions Station Department
Transmission Operations Division
Ontario Hydro

66. Dr. A.W. Jackson
Technical Supervisor
Environmental Protection Department
Ontario Hydro

67. Mr. W.J. Janis
Chemist, Petroleum Products & Insulating Fluid Unit
Chemical Research Department
Research Division
Ontario Hydro

8.6 List of Witnesses (cont'd.)

68. Mr. R.A. Sogawa
Section Head
Land Use and Environmental Planning Department
Design & Development Division - Transmission
Ontario Hydro

69. Mr. G.S. Rajhans
Chief, Occupational Health
Engineering Service
Occupational Health Hygiene Services Branch
Ontario Ministry of Labour

70. Mr. C.E. McIntyre
Director
Environmental Approvals &
Project Engineering Branch
Ontario Ministry of the Environment

71. Mr. Charles J. Shaw
Versaflow Inc.
Toronto, Ontario

72. Mr. Craig Douglas Camplong
Canadian Chemical Producers'
Association (CCPA)
Toronto, Ontario

73. Mr. Romeo Palombella
Regional Municipality of
Hamilton-Wentworth

74. Dr. F.G. Bercha
President, F.G. Bercha & Assoc. Ltd.
Calgary, Alberta

75. Dr. D.G. Dixon
Assistant Professor
Department of Biology
University of Waterloo

76. Dr. Ellen K. Silbergeld
Chief, Neurotoxicology Section
Environmental Defence Fund
Washington, D.C.

77. Mr. Brian M. Winters
National Marketing Manager
Kinetic Ecological Resource
Group (1982) Ltd.

78. Dr. R.F. Willes
Consultant Toxicologist
F.D.C. Consultants, Inc.

79. Dr. Colin J. Baynes
Environmental Consultant
CJB Associates Inc.

8.6 List of Witnesses (cont'd.)

80. Mr. John J. McKernan
Assistant Vice-President
Marsh and McLennan Ltd.

81. Mr. Michael Hodge
Assistant Vice-President
Marsh and McLennan Ltd.

82. Dr. Frank A. Henning
Principal, Envirochem Services
Burnaby, B.c.

83. Mr. John A. Jackson
Jackson, Weller & Assoc.

84. Mr. Harold M. Dinning
Operations Assistant
Department of Public Works
Town of Oakville

85. Mr. Bruce Small
Toronto Board of Education

86. Mr. Otto Langmark
Toronto Board of Education

87. Ms. Fiona Nelson - Trustee
Toronto Board of Education

88. Ms. S. Holliday-Rhodes
Haliburton, Ontario

89. Mayor C.O. Hodgkins
Township of West Lincoln

90. Mr. Ron Eddy - President
Association of Municipalities of Ontario

91. Ms. Claudette Miller - Vice President
Association of Municipalities of Ontario

92. Mr. Lou Romano
Association of Municipalities of Ontario

93. Mr. J.H. Cullen
Paisley, Ontario

94. Mrs. F.M. Mackasey
Toronto, Ontario

95. Dr. Fuad Kurdi
Parkdale Residents Association

96. Mr. L.M. Kennaley - Planner
Region of Haldimand-Norfolk

8.6 List of Witnesses (cont'd.)

97. Mr. D.Y. Perlin
Region of Halton

98. Mr. Donald Cane
Simcoe Engineering

99. Dr. R.B. Caton
Concord Scientific Corp.

100. Mr. T. Savastano
Sunohio, Canton, Ohio

101. Mr. J. Kozak
Sunohio, Canton, Ohio

102. Mr. R. Mitchell
Sunohio, Canton, Ohio

103. Mr. Richard Barry, President
United Electrical, Radio &
Machine Workers of Canada

104. Ms. Kim Perrotta - Research Officer
United Electrical, Radio &
Machine Workers of Canada

105. Mr. James W. Boland - Field Representative
Canadian Union of Public Employees -
Local 1000

106. Mr. John Eleen - Research Director
Ontario Federation of Labour

107. Mr. R.J. Redhead
Tricil Limited

108. Mr. A.W. Mowat
Eriez of Canada Ltd.

109. Mr. Ian D. Thom
Pyrolysis Systems Inc.

110. Mr. E.R. Whelan
Toronto Hydro

111. Mr. Richard Boehnke
City of Toronto
Department of Public Health

112. Mr. J.D. Feeney
Assistant Superintendent of Research
Metropolitan Separate School Board

113. Dr. M.A. McGuigan
Director, Poison Information Centre
Hospital for Sick Children

8.6 List of Witnesses (cont'd.)

114. Mr. R. Kent Gillespie
Legal Department
City of Mississauga

115. Dr. Carl St. Pierre
Industrial Research Institute
of the University of Windsor

116. Dr. Alex Gnyp
Industrial Research Institute
of the University of Windsor

117. Mr. Peter E. Winch
Rondar Inc.

118. Mr. Peter S. Mitchell
Vice President
New Energy Canada Ltd.

119. Mr. John H. Lanier, Jr.
Ensco Inc.

120. Dr. Maris A. Lusis
Supervisor
Atmospheric Process Studies
Ontario Ministry of the Environment

8.7 List of Exhibits

1	Affidavit of Service sworn November 5, 1984, by Yvonne Fernandes.
2	Affidavit sworn September 10, 1984 by R.A. Abbott.
3	Report on Consultation Process dated November 5, 1984.
4	Preliminary Hearing Document on Proposals for the Regulation of Mobile PCB Destruction Facilities in Ontario, September 1984.
4(A)	Revision to Preliminary document dated October 16, 1984.
4(B)	Revision #2 dated October 25, 1984, to page 257 of Preliminary Hearing document.
5	Curricula Vitae of MOE witnesses.
5(A)	Curricula Vitae - MOE witnesses.
6	Update of Chapter 3.5 of the Hearing prepared by Dr. Stephen Safe.
7	Regulation of PCB's in Canada by Donald L. Grant being Chapter 27 of PCBs: Human and Environmental Hazards.
8(A)	A Guide to Eating Ontario Sport Fish, Southern Ontario, Great Lakes.
8(B)	Guide to Eating Ontario Sport Fish, Northern Ontario, Lake Huron, Lake Superior.
9(A)	Diagram: PCB in Spottail Shiners Niagara River at Niagara on the Lake.
9(B)	Reverse side of 9(A): Average PCB Levels in Rainbow Trout - Lake Ontario at Ganaraska River.
10	1984 PCB Air Sampling Results - Westinghouse.
	Explanation of Risk Function Calculations. Risk of Neoplastic Nodules from PCB Exposure.
13	Excerpt from Hearings Before the Subcommittee of the Committee of Merchant Marine and Fisheries, House of Representatives.

8.7 List of Exhibits (Cont'd.)

14	Background Information Setting of Air Quality Objectives and Standards (Historical Perspective).
15	List of Tentative Standards, Guidelines and Provisional Guidelines for Air Contaminants.
16	Examples of Meteorological Conditions.
17	Sulphur Dioxide Levels, by Selected City 1969 - 1983.
18	Witness Statement of E.W. Piche re Mobile Destruction of PCB Wastes.
19	Water Management (Blue Book) as revised May 1984.
20	Rationale for Establishment of Ontario's Provincial Water Quality Objectives - PCB Section.
21	Provincial Water Quality Objective for PCB.
22	Background Information, Establishing the Provincial Guideline for Dioxins and Furans.
23	Report of the Joint Health and Welfare Canada/Environment Canada Expert Advisory Committee on Dioxins, November 1983.
24	Affidavit of Yvonne Fernandes sworn November 8, 1984.
25	Risk Estimation for 2378-TCDD Based on Approach Used for PCB Risk Estimation.
26	Ratios of Volume of Air Breathed to Body Weight.
27	Comparison of Mantel and Byron Model to Linear Model Used by Mr. Kusiak.
28	Monitoring Definitions.
29	EPA PCB Regulations May 31, 1979.
30	Submission by Julianne Lucas and Jerry Chmielewski of Sorauren Avenue and area.
31	Submission by St. Clair W. PCB Action Committee.
31(A)	Amendment to Exhibit 31 - St. Clair W. PCB Action Committee.

8.7 List of Exhibits (Cont'd.)

32	Brief of Tony Ruprecht, M.P.P.
33	Submission by Dufferin/Lansdowne Residents Association CGE Cleanup and Planning Subcommittee.
34	Submission of Davenport PCB Committee.
35	Submission of Alderman Richard Gilbert.
36	Environment Canada - Destruction Technologies for PCBs dated July 1983.
37	Results of Initial Trial Burn of the EPA - ORD. Mobile Incineration System from Proceedings of 1984 National Waste Processing Conference.
38	Sketch - General Relationship Between Carbon Monoxide and Theoretical Air for Combustors.
39	Origin and Management of PCB Waste - April 1984.
40	Details of HiVol Sorbent Cartridge.
41	Trace Organic Sampling Train.
42	Trace Mass Spectrometric Analysis for PCDD/PCDF.
43	Detection Limits PCDD/PCDF, PCB/CB/CP.
44(A)	Flipchart explanation of analytical techniques.
44(B)	" " " "
44(C)	" " " "
44(D)	" " " "
44(E)	" " " "
44(F)	" " " "
45(A)	Material Balance Example.
45(B)	Material Balance Sketch with examples.
45(C)	Destruction Efficiency Example.
45(D)	Destruction and Removal Efficiency.
46	Distribution of PCB's in Ontario - Update August 31, 1984.

8.7 List of Exhibits (Cont'd.)

47 Memorandum to file from D.H. Edwards re PCB/Sunohio's PCBX Process dated September 4, 1984.

48 Brief presented by Nick Trainos on behalf of Joseph Piccininni.

49 Brief by Erich K. Kronlachner.

50 Regal Heights Residents Association Brief dated December 5, 1984.

51 Guidelines for the Regulation and Siting of Mobile PCB Destruction Facilities, a discussion paper February, 1983.

52 Proposed Testing Requirements for the Demonstration of Mobile PCB Destruction Facilities - May 1984.

53 Revised Proposals for the Regulation of Mobile PCB Destruction Facilities - May 1984.

Proposed Ont. Regulation under E.P.A. Mobile PCB Destruction Facilities and Proposed Regulation to Amend Regulation 293 of Revised Regulations of Ontario 1980 made under Environmental Assessment Act, May 1984.

55 Proposals for Regulation of Mobile PCB Destruction Facilities in Ontario.

56 Notice of Public Information Centres and List of Newspapers containing Notice.

57 Environment Canada Pamphlet on PCB's.

58 M.O.E. Fact Sheet "About PCB's" - revised February 1984.

59 Paper entitled "PCB Disposal: A Medical Position".

60 Paper entitled "Health Effects of Polychlorinated Biphenyls".

61 Paper entitled "The PCB Imbroglio".

62 Poster displays at Open Houses.

63 List of Newspapers containing Advertisements of Commmencement of PCB Public Inquiry.

64 Submission by Ontario Mining Association.

8.7 List of Exhibits (Cont'd.)

65	Submission by Ontario Forest Industry Association.
66	Letter from City of Sudbury to the Commission dated December 28, 1984 with certified copy of Resolution.
67	Brief of the Council of the Corporation of the City of Peterborough on behalf of its citizens before a Commission of Inquiry on the Regulatory Control of Mobile PCB Destruction Facilities at its public hearing to be held January 7th, 1985.
68	Submission of the Township of Otonobee, January 7, 1985.
69	Presentation of the Peterborough Greens, dated January 7, 1985.
70	C.V. of Dr. Christopher D. Metcalfe.
71	C.V. of Dr. Robert A. Stairs.
72	Presentation of Victor Norman.
73	Affidavit of Marilyn Corrigan dated January 7, 1985.
74	Presentation of City of London.
75	Submission of Jan Poniecki.
76	Submission of Corporation of City of Windsor.
	Resolution of Council of City of Windsor, dated October 26, 1984.
	Resolution of Council of City of London, September 18, 1984.
79	Submission by Alderman Murray Berman, as representative of the City of Chatham.
80	Conversion of nanograms per dry standard cubic foot to nanograms per dry standard cubic meter in relation to evidence given by Mr. T. Oppelt.
81	Resume of Dr. P.K. Misra.
82	Excerpt of section 18(4) from Fire Marshal's Act, R.S.O. Ch. 166.

8.7 List of Exhibits (Cont'd.)

83	Supporting information for ambient air concentration calculations from a spill.
84	Vapour Pressure of Aroclors 1016, 1242 and 1254.
85	Sample calculation for determining the concentration of aroclor 1016 downwind from a spill.
86	Downwind concentrations of PCBs based on circular spill area.
87	Behaviour of PCBs in Soils and Plants. H.J. Strek and J.B. Weber.
88	Part of Study - Facilities for Storage of PCB Wastes prepared for Ontario MOE by Dillon, dated October 1979. Selection of Sites and Handling Systems.
88(A)	Page 143, excerpt from Study.
88(B)	Page 140, excerpt from Study.
88(C)	Dillon Report October 1979 Facilities for Storage of PCB Wastes. (Full report).
89	Properties of aroclors as used by Dr. Misra.
90	Ontario Hydro submission, January 15, 1985.
91	The Low Level PCB Oil Decontamination Process.
92	Recorded Spills of PCB Materials in Ontario.
93	Emergency Plans Act 1983, ch. 30.
94	A Guide to the Occupational Health and Safety Act 1978. Published by the Ministry of Labour.
95	A Guide to the Provisions of Ontario's Occupational Health and Safety Act. Published by the Industrial Accident Prevention Association.
96	Memorandum dated 84 08 17 from G.S. Rajhans to Dr. P.L. Pelmear.
97	Certificates of Approval associated with Tricil Limited.
98	Classification Guideline for Hauled Liquid Industrial Wastes.

8.7 List of Exhibits (Cont'd.)

99	Victoria Hospital Corporation Certificates of Approval.
100	Projected Air Emissions from Tricil facilities.
101	Levels of PCBs in soil sprayed with wastewater containing 5 ug/l (ppb) vs. Quantity of wastewater applied, prepared by Dr. S. Linzon.
102	Amendment to 8.2.8.6 i B of Exhibit 4.
103	Puff Model - Due to an Explosion of a PCB Destructor - Class I Type.
104	Submission from Canadian Chemical Producers' Association.
105(A)	Aug. 17/84 Report to Engineering Services Committee - Regional Municipality of Hamilton-Wentworth.
105(B)	Resolution of Council dated Sept. 6/84 dealing with Report.
105(C)	Report to Engineering Services Committee dated August 18, 1983.
105(D)	Resolution of Council dated September 6, 1983.
105(E)	Report of April 18, 1983 to Engineering Services Committee.
105(F)	Resolution of Council dated May 3, 1983 dealing with Report.
106	Letter dated February 6, 1985 from Workmen's Compensation Board on claims re exposure to PCBs.
107	Resume of Dr. F.G. Bercha and Witness Statement.
108	Testimony of Dr. F.G. Bercha.
109	Pages 54, 55 and 56 of Report entitled "Risks Associated with Transportation and Storage of PCBs for Disposal at a Cement Plant March 1980" by F.G. Bercha & Associates Ltd.
110	Witness Statement of Dr. George Dixon.
111	Curriculum Vitae of Dr. George Dixon.

8.7 List of Exhibits (Cont'd.)

112	Curriculum Vitae of Dr. Ellen Kovner Silbergeld.
113	Witness Statement of Dr. Ellen Kovner Silbergeld.
114	Calculations of Inhalation Risks from Ingestion Risks.
115	Report on the Potential Environmental and Human Health Impacts of Exposure to Polychlorinated Biphenyls, Polycholorinated Dibenzo-p-Dioxins and Polychlorinated Dibenzo-furans by Dr. Robert F. Willes.
116	Abstract of paper entitled Bioavailability of Fly-Ash adsorbed PCDD's and PCDF's in the Rat, Guinea Pig and Syrian Golden Hamster.
117	A brief presented by Kinetic Ecological Resource Group (1982) Ltd.
118	Curriculum Vitae of Dr. .R.F. Willes and Terms of Reference.
119	Calculations of Inhalation Exposure from Ingestion Exposure replacing Exhibit 114.
120	Dose Response curves.
121	Dioxin Analysis in Stack Emissions and in the Wash Water Circuit During High-Temperature Incineration of Chlorine Containing Industrial Wastes.
122	ADI/Application.
123	Curriculum Vitae and witness statement of Dr. Colin J. Baynes.
124	Emission Rates derived from allowable point of impingement concentrations for the Pyromagnetic Facility.
125	Witness Statements and CVs of M. Hodge and J.J. McKernan.
126	Liability Requirements U.S. E.P.A. April 7, 1982.
127	Article from Risk Management magazine, February 1985.
128	Submission of F.A. Henning of Envirochem Services. Review and Assessment of Testing Protocols and Operational Guidelines Contained in MOE proposals.

8.7 List of Exhibits (Cont'd.)

128(A)	Resume of Dr. Frank Allen Henning.
128(B)	Excerpts from Quality Assurance and Quality Control procedures for demonstrating PCB Destruction.
128(C)	Excerpts from Guidance Manual for Evaluating Permit applications for operation of Incinerator units.
128(D)	Services provided for by Envirochem Services.
	Transcript of presentation by Dr. Henning entitled "PCB the Simple Truth" prepared on behalf of M.O.E., presented in May 1984.
130	Witness statement of John Jackson.
131.	Blueprint For Waste Management in Ontario.
132	Submission of the Town of Oakville.
133	Curriculum Vitae of Bruce McGregor Small.
134	Brief by Board of Education for the City of Toronto on the Regulatory Control of Mobile PCB Destruction Facilities.
135	Submission of Township of West Lincoln.
136(A)	Photograph of D & D site at Smithville.
136(B)	Photograph of D & D site at Smithville.
136(C)	Photograph of D & D site at Smithville.
137(A)	Submission by Association of Municipalities of Ontario.
137(B)	A.M.O. Reports 83-11.
138	Submission by J.H. Cullen.
139	Curriculum Vitae of Dr. Fuad H. Kurdi.
140	Submission by Dr. F. Kurdi on behalf of Parkdale Residents' Committees' Coalition.
141	Submission of Regional Municipality of Halton.
142	Certified copy of motion of Regional Municipality of Halton, March 6, 1985.
143	Curriculum Vitae of Dennis Y. Perlin.

8.7 List of Exhibits (Cont'd.)

144	Certified copy of By-law 127-84 of Regional Municipality of Halton.
145	Report by D.D.B. Cane to Regional Municipality of Halton.
146	Motion of Regional Municipality of Haldimand-Norfolk dated November 8, 1984.
147	Brief of Regional Municipality of Haldimand-Norfolk dated October 1984.
148	Report of Concord Scientific Corporation on behalf of Regional Municipality of Halton.
149	Evaporation models.
150	Letter from Dr. D. Mackay dated February 28, 1985.
151	Submission by United Electrical Radio and Machine Workers of Canada dated March 13, 1985.
152	Letter to Commission from Canadian Union of Public Employees, Local 1000, dated March 13, 1985.
153	Submission of Canadian Union of Public Employees, and Local 1000, Ontario Hydro Employees' Union.
154	Presentation of R.J. Redhead on behalf of Tricil Limited.
155	Paper - Evaporation Rate of Spills of Hydrocarbons and Petroleum Mixtures from Environmental Science Technology 1984.
156(A)	Excerpt - Approximate per cent composition of some commercial PCB Products.
156(B)	Excerpt from paper containing Vapour Pressures of PCB Isomers.
157	Paper entitled "Survey of Polychlorinated Biphenyls in Ambient Air Across The Province of Ontario" by Singer, et al.
158	Presentation of Pyrolysis Systems Inc.
159	Presentation by Toronto Hydro.
160	Presentation by Department of Public Health, City of Toronto.

8.7 List of Exhibits (Cont'd.)

161 A study of Health Status of Residents of the Junction Triangle of Toronto dated September 1984.

162 Report No. 10 of the Board of Health dealing with the Junction Triangle Health Study as approved by City Council of the City of Toronto.

163 PCB Fire Model.

164 Excerpts from 1984 Annual Report of Director of Education of Metropolitan Separate School Board.

165 Some Metropolitan Separate School Board statistics.

166 Curriculum Vitae of Dr. Michael A. McGuigan.

Report of Dr. M.A. McGuigan - The Effects of PCBs on the Human Body with particular attention to Children.

168 Epidemiology and Pathology of a Tetrachlorodibenzodioxin Poisoning Episode by Kimbrough et al.

169 Neurological Studies of PCB-Poisoned Patients by Chia and Chu.

170 Submission by the Corporation of the City of Mississauga.

171 Memorandum of G.E. Bentley, Chief, Fire Department to R. Kent Gillespie dated January 15, 1985.

172 Submission on behalf of the Industrial Research Institute, University of Windsor.

173 Curriculum Vitae of Dr. Carl C. St. Pierre.

174 Curriculum Vitae of Dr. Alex C. Gnyp.

175 Written submissions

W.S.-1 Mr. R. Douglas Kennedy, M.P.P.

W.S.-2 Mr. R.E. Bowley.

W.S.-3 The Regional Municipality of Waterloo.

W.S.-4 Mr. Jan Poniecki.

8.7 List of Exhibits (Cont'd.)

W.S.-5	Association of Municipal Electrical Utilities (of Ontario).
W.S.-6	Windsor Utilities Commission.
W.S.-7	Association of Municipalities of Ontario.
W.S.-8	The Board of Health for the City of Toronto Health Unit.
W.S.-9	A.W. Mowat & Associates.
W.S.-10	Watchdog Committee Against Pollution.
W.S.-11	Corporation of the Township of Dover.
W.S.-12	Township of West Lincoln.
W.S.-13	The Corporation of the Town of Oakville.
W.S.-14	The Corporation of the Town of Caledon.
W.S.-15	The Corporation of the City of Chatham.
W.S.-16	The Corporation of the City of Windsor.
W.S.-17	County of Peterborough.
W.S.-18	The Corporation of the City of Toronto.
W.S.-19	The Corporation of the City of London.
W.S.-20	Canadian Steel Environmental Association.
W.S.-21	The Regional Municipality of Peel.
W.S.-22	Mrs. C. Meneses.
176	Submission of Rondar Inc.
177	Submission of New Energy Canada Limited.
178	Preliminary Permit application by Pyrotech Systems Inc.
179	Technical Description of a 2000 Unit.

8.7 List of Exhibits (Cont'd.)

180		Written Submissions
	W.S.-23	Alex Chumak, Trustee Toronto Board of Education - and - Walter Melnyk, Trustee Metro Separate School Board
	W.S.-24	Tricil Limited
	W.S.-25	The Board of Health for the City of Toronto Health Unit.
	W.S.-26	Waterloo Public Interest Research Group.
	W.S.-27	(a) The Regional Municipality of Hamilton-Wentworth.
		(b) The Regional Municipality of Hamilton-Wentworth.
	W.S.-28	Amy Murabayashi.
	W.S.-29	West Kingsway Ratepayers Association.
	W.S.-30	Corporation of the Township of Holland.
181		Resume and witness statement of Dr. Mario A. Lusis.
182		Model Calibration and Evaluation Using Field Measurements of Evaporation from PCB Mixtures by P.K. Misra.
183		Note on Evaporation of PCB Mixtures by P.K. Misra, R. Bloxam.
184		Verification of Evaporation of aroclor 1254 with the data of laboratory experiment.
185		Diffusivity of PCB in aroclor 1254 and aroclor 1016.